Vol. 1031, No. 3

# OFFICIAL GAZETTE

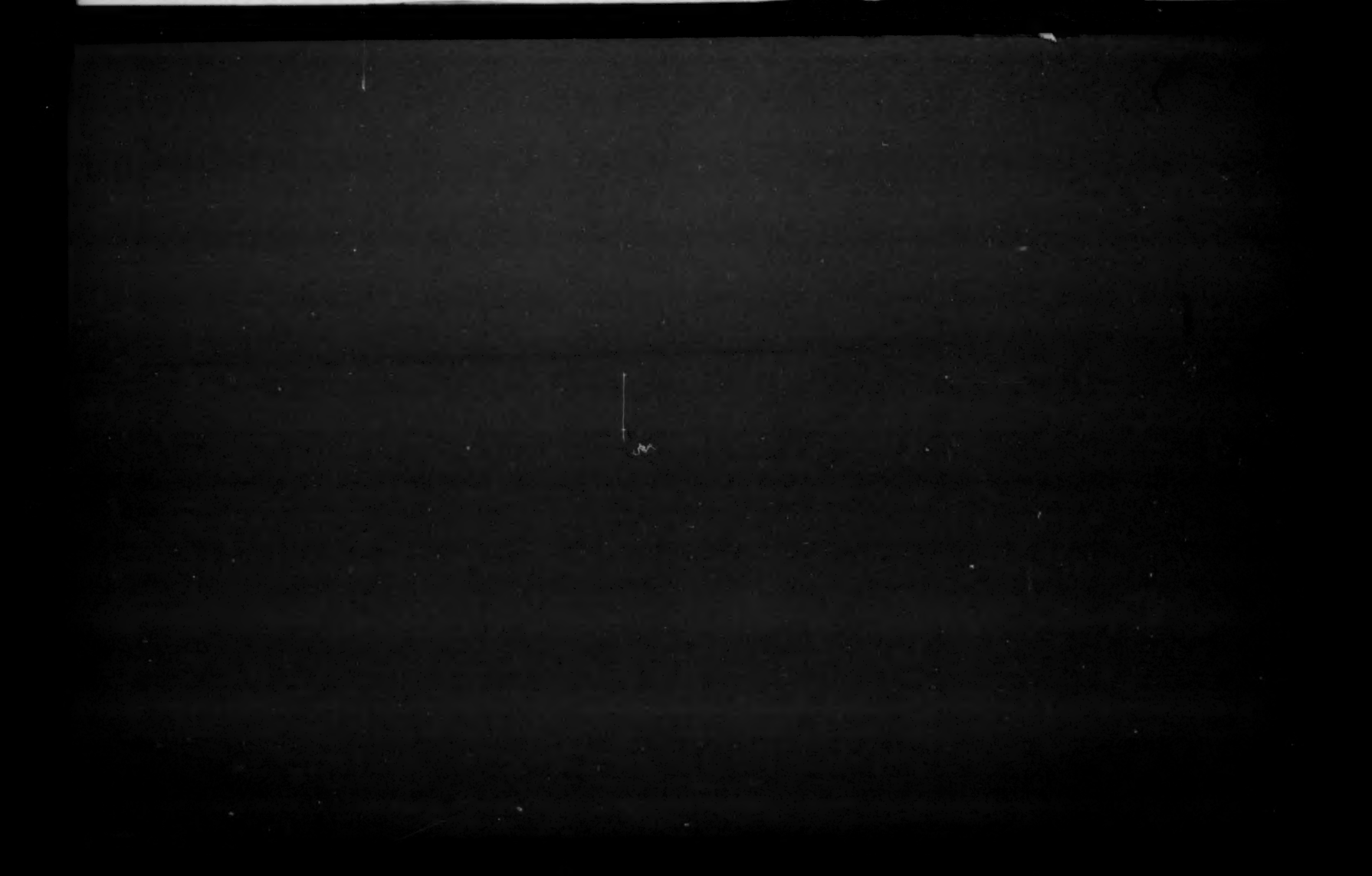
of the

# UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office



# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 21, 1983 Volume 1031 Number 3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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

| | |
|---|---|
| Transmittal fee | $ 125.00 |
| Search fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| · No corresponding prior U.S. national application filed | 500.00 |
| · Corresponding prior U.S. national application filed | 250.00 |
| European Patent Office as Searching Authority | |
| · All cases | 670.00 |
| International Fees | |
| Basic Fees (first 30 pages) | 265.00 |
| Basic Supplemental Fee (for each page over 30) | 5.00 |
| Designation fee (for each national or regional office) | 65.00 |

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,900,886,** Re. S.N. 404,772, Filed July 28, 1982, Cl. 358/82, SONIC COLOR SYSTEM, Jan R. Coyle, et al., Owner of Record: *Atari, Inc., Sunnyvale, Calif.,* Attorney or Agent: Newton H. Lee, Jr., Ex. Gp.: 233

**3,960,927,** Re. S.N. 458,116, Filed Jan. 14, 1983, Cl. 560/38, OLEFINIC DERIVATIVES OF AMINO ACIDS, Brian W. Metcalf, et al., Owner of Record: *Merrell Toraude et Compagnie, Strasbourg, France,* Attorney or Agent: William J. Stein, et al., Ex. Gp.: 126

**4,002,769,** Re. S.N. 367,010, Filed Apr. 9, 1982, Cl. 424/339, INSECT MATURATION INHIBITOR, Meyer Schwarz, et al., Owner of Record: *United States Government, as Represented by the Secretary of Agriculture, Washington, D.C.,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 125

**4,002,769,** Re. S.N. 367,011, Filed Apr. 9, 1982, Cl. 424/339, INSECT MATURATION INHIBITOR, Meyer Schwarz, et al., Owner of Record: *United States Government, as Represented by the Secretary of Agriculture, Washington, D.C.,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 125

**4,262,369,** Re. S.N. 486,037, Filed Apr. 18, 1983, Cl. 003/1.912, ARTIFICIAL JOINTS, IN PARTICULAR COXO-FEMORAL JOINTS, Christiane Roux, Owner of Record: *Inventor,* Attorney or Agent: Vincent L. Ramik, et al., Ex. Gp.: 336

**4,323,105,** Re. S.N. 479,948, Filed Mar. 29, 1983, Cl. 160/309, WINDOW SHADE ROLLER ASSEMBLY, Joel Berman, et al., Owner of Record: *Inventors,* Attorney or Agent: Morton Amster, et al., Ex. Gp.: 354

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**No Publications This Issue**

### Department of the Treasury
### United States Customs Service

19 CFR Part 133

Application for Recordation of Trade Name:

"PLAYERS & SPECTATORS A DRINKING AND GAMING ESTABLISHMENT"

**Agency:** U. S. Customs Service, Department of the Treasury

**Action:** Notice of Application for Recordation of Trade Name

**Summary:** Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under Section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "PLAYERS & SPECTATORS A DRINKING AND GAMING ESTABLISHMENT," used by Players & Spectators, Inc., a corporation organized under the laws of the State of Wash., located at East 27 Augusta, Spokane, Wash. 99207.

The application states that the trade name is used in connection with a combined restaurant, tavern and amusement game services and franchise business.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

**Date:** Comments must be received on or before July 18, 1983.

**Address:** Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Room 2417, Washington, D.C. 20229.

**For Further Information Contact:** Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

A. PIAZZA,
May 12, 1983. *Acting Director, Entry Procedures and Penalties Division.*

**Department Of Commerce**
**Patent and Trademark Office**
37 CFR Part 2
(Docket No. 30428-69)
Trademark Applications and Examination Proceedings; Trademark Interference, Concurrent Use, Opposition and Cancellation Proceedings; Trademark Post-Registration Proceedings

**Agency:** Patent and Trademark Office, Commerce.

**Action:** Final rule.

**Summary:** The Patent and Trademark Office is amending the rules of practice in trademark cases to clarify and revise procedures for the examination of applications; appeals from final refusals of registration; the institution and/or conduct of trademark interference, concurrent use, opposition and cancellation proceedings; the examination of affidavits or declarations under section 8 of the Trademark Act of 1946; amendments to registrations under section 7 (d) of the Trademark Act; and petitions to the Commissioner. The procedures revise or codify existing practices, or simplify procedures, or establish periods of time, to assist the orderly and prompt resolution of issues.

**Effective Date:** June 22, 1983.

**For Further Information Contact:** Miss Janet E. Rice by telephone at (703) 557-3551 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Janet E. Rice, Crystal Square 5, Suite 1008, Washington, D.C. 20231.

**Supplementary Information:** Amendments to §§2.20, 2.27, 2.63, 2.64, 2.65, 2.72, 2.81, 2.96, 2.98, 2.99, 2.101, 2.102, 2.103, 2.104, 2.105, 2.106, 2.107, 2.111, 2.112, 2.113, 2.115, 2.116, 2.117, 2.120, 2.121, 2.122, 2.123, 2.124, 2.125, 2.127, 2.128, 2.129, 2.131, 2.132, 2.134, 2.135, 2.142, 2.146, 2.165, 2.173, 2.184, and 2.186 and the removal of §§2.88, 2.94, 2.95, 2.97, 2.126, 2.147, and 2.148 were proposed in a rulemaking notice published in the **Federal Register** on June 29, 1982, at 47 FR 28324, the Patent and Trademark Office *Official Gazette* of July 27, 1982, at 1020 O.G. 25, and Vol. 24 of *BNA's Patent, Trademark & Copyright Journal* (July 1, 1982) at p. 236. The purpose of these proposed amendments was to revise and codify existing practices. One of the proposed amendments (subsequently not adopted) was to interchange §§2.101 and 2.102. Interested parties were requested to submit written comments on or before Oct. 4, 1982. An oral hearing was held on the same date. Written comments were submitted by four organizations and four individuals. Three persons testified at the oral hearing. Two of the individuals testified in behalf of organizations which also submitted written comments. Each of the two testified that the organization which he represented approved of the proposed amendments except as indicated in the organization's written comments. The third individual testified concerning the history and purpose of the proposed amendments and expressed his approval of them.

However, further changes to several of these proposed rules, as well as amendments to other trademark rules, were required in order to implement certain trademark provisions of intervening Pub. L. 97-247 enacted Aug. 27, 1982. The text of the law is published in the Patent and Trademark Office *Official Gazette* of Oct. 26, 1982, at 1023 O.G. 31.

Provisions of Pub. L. 97-247 relating to trademark fees were implemented by trademark fee rule changes which were published in the **Federal Register** on July 30, 1982 at 47 FR 33086 and which took effect on Oct. 1, 1982. That final rule document was based alternatively on the law in effect at that time, Pub. L. 96-517, and on H.R. 6260, which was then pending but is now Pub. L. 97-247. As a result of the fee rule changes, which were based on Pub. L. 97-247 and subsequently confirmed in a document published in the **Federal Register** on Sept. 17, 1982 at 47 FR 41282, further changes to §2.101 [identified in the June 29, 1982 notice as §2.102] were required.

Additional changes to §2.101 [identified in the June 29, 1982 notice as §2.102] and §2.111, the removal of §2.103, and changes to §§2.161 and 2.162 were required in order to implement the provisions of Sections 8 and 9 of Pub. L.97-247. Section 8 of the new law amends Section 8 of the Trademark Act of 1946 (15 U.S.C. 1058) to require that an affidavit or declaration filed under Section 8 show use of the mark in commerce. Section 9(a) amends Section 13 of the Trademark Act (15 U.S.C. 1063) to eliminate the requirement for verification of oppositions (thus permitting a party's attorney to sign an opposition before the Trademark Trial and Appeal Board), and to require that additional requests for extension of time to oppose be filed prior to the expiration of the extension. Section 9(b) amends Section 14 of the Trademark Act (15 U.S.C. 1064) to eliminate the requirement for verification of petitions to cancel (thus permitting a party's attorney to sign petitions to cancel before the Trademark Trial and Appeal Board). The provisions of Sections 8 and 9 of the new law became effective Feb. 27, 1983.

The additional proposed changes to §1.101 (identified in the June 29, 1982 notice as §2.102) and §2.111, the changes to §§2.161 and 2.162, and the proposed removal of §2.103, all required as a result of the enactment of Pub. L. 97-247, were published in the **Federal Register** on Nov. 24, 1982 at 47 FR 53054. In that notice, as in the June 29, 1982 notice, §§2.101 and 2.102 were interchanged, and it was indicated in the notice that although §2.102 [identified in the notice as §2.101] and §2.112, as proposed in the June 29, 1982 notice, already included the necessary changes called for by Pub. L. 97-247 and thus were not being republished, further comments on the two proposed rules would be entertained. Interested parties were requested to submit written comments on or before Jan. 7, 1983. Comments were received from one organization.

In a notice of final rulemaking published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972, and in the *Official Gazette* of Feb. 22, 1983 at 1027 O.G. 129, §2.103 was removed, and §§2.101, 2.102, 2.111, 2.112, 2.161, and 2.162 were amended, to incorporate changes adoped both as a result of the notice of proposed rulemaking of June 29, 1982 (to revise and codify existing practices) and as a result of the notice of proposed rulemaking of Nov. 24, 1982 (to implement the provisions of Sections 8 and 9 of Pub. L. 97-247). All of the comments relating to §§2.101, 2.102, 2.103, 2.111, 2.112, 2.161, and 2.162 which were received in response to the two notices of proposed rulemaking were discussed in that final rule notice and the rule changes adopted therein became effective on Feb. 27, 1983.

Accordingly, this final rule notice does not include a discussion of the comments relating to §§2.101, 2.102, 2.103, 2.111, and 2.112 which were received in response to the June 29, 1982 notice of proposed rulemaking.

Discussion of Specific Sections Changed:

The rules which are being amended are discussed below. (The designation § is used in The Code of Federal Regulations to denominate a rule. If internal division of a section is necessary, it is divided into paragraphs designated as follows: "a", "b", etc. at the first level; "1", "2", etc. at the second level; "i", "ii", etc. at the third level; "A", "B", etc. at the fourth level; "*1*", "*2*", etc. at the fifth level; and "*i*", "*ii*", etc. at the sixth level.)

In this preamble to the rulemaking, "Patent and Trademark Office" is abbreviated as "PTO" and "Trademark Trial and Appeal Board" is abbreviated as "TTAB".

Section 2.20 was proposed to be amended by the addition of a new paragraph (b) to codify the practice whereby a nonofficer of a corporation or association who is authorized to sign a notice of opposition or petition for cancellation may verify the pleading by a declaration in lieu of an oath or affirmation. Inasmuch as the requirement for verification has been eliminated (See Pub. L. 97-247, enacted Aug. 27, 1982 and the final rule notice published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972), this proposal is withdrawn as moot.

Section 2.27(e) is added to permit the PTO to retain in confidence, not available for public inspection, anything filed under seal pursuant to a protective order [see amended §§2.120(f) and 2.125(e)]. Conforming amendments are made in paragraphs (b) and (d) of §2.27.

Section 2.63 is clarified and designated as paragraph (a).

Section 2.63(b) is added to codify the practice of allowing an applicant to petition to the Commissioner for relief from either an examiner's repeated but nonfinal formal requirement which is appropriate for petition to the Commissioner or a final action which is limited to subject matter which is appropriate for petition to the Commissioner. The paragraph also requires that a petition be timely and sets a time limit for action after denial of a petition. See amended §2.146(b) for a description of nonpetitionable subject matter and amended §2.146(d) for the time limit (sixty days) for a petition. The final text includes a phrase that was not included in the proposed paragraph, namely, the phrase "and the subject matter of the requirement is appropriate for petition to the Commissioner" which now appears in the clause "(1) the requirement is repeated, but the examiner's action is not made final, and the subject matter of the requirement is appropriate for petition to the Commissioner;". The phrase has been added in order to further clarify the intent of the paragraph and is not considered to result in a material alteration thereof.

Section 2.64 is designated as paragraph (a) and revised to agree with the provision in §2.63(b) permitting petitions to the Commissioner concerning some requirements which have been made final.

Section 2.64(b) is added to clarify the existing practice of replying to requests for reconsideration after final action, and to permit entry of amendments accompanying such requests if they comply with the Act of 1946 and the rules of practice in trademark cases.

Section 2.65 is designated as paragraph (a) and amended by the addition of a sentence to provide that a timely and proper petition under §2.63(b) avoids the abandonment of an application. A new paragraph (b) permits the examiner to allow an applicant additional time to explain and supply an inadvertent omission which would otherwise have resulted in the application being held abandoned. The final text of (b) includes a phrase that was not included in the paragraph as proposed, namely, the phrase "filed within the six-month response period" which now appears in the clause beginning "When action by the applicant filed within the six-month response period is a bona fide attempt to advance the examination of the application * * *." The phrase has been added in order to further clarify the intent of the paragraph and is not considered to result in a material alteration thereof.

Section 2.72 is revised so that the standard for amendment of a mark in an application now is the same in terms as the standard for amendment of a registered mark set forth in section 7(d) of the Act of 1946.

Section 2.72 was proposed to be further revised to allow non-material changes in the drawing to be supported by specimens which were not necessarily in use at the time the original application was filed. However, upon further consideration, it appears that the proposed revision might result in so many amendments to marks as to constitute a burden on the Patent and Trademark Office. Accordingly, this part of the proposal is withdrawn.

Section 2.81 is revised to clarify the language of the section. Proposed §2.81 has been slightly reworded herein so as to further improve the clarity of the section.

Section 2.88 is deleted because requests to consolidate applications are very rare and the procedure is unworkable. See Official Gazette notice of July 29, 1981, 1009 TMOG 17.

Section 2.94 is deleted because interferences are declared only upon petition [see §2.91], which assumes proper review before an interference is declared, and existing §2.94 is unnecessary.

Section 2.95 is deleted because the deletion of §2.94 makes §2.95 unnecessary.

Section 2.96 is amended to codify existing practice on the issues determinable in an interference and the order of the parties and burden of proof. The amended rule states who is the junior party if two applications have the same filing date but different dates of execution. The third and fourth sentences of proposed §2.96 have been reworded herein so as to improve the clarity of the section.

Section 2.97 is deleted because it is unnecessary in view of the codification in §2.96.

Section 2.98 is amended to make the rule consistent with existing §2.91.

Section 2.99 is reorganized and amended to describe the concurrent use application procedure in greater detail. Paragraph (a) of the amended rule provides that an application for a concurrent use registration will be examined in the same manner as other applications for registration.

Paragraphs (b) and (c) and paragraph (d)(1) of §2.99 describe the procedure to be used to institute a concurrent use proceeding.

Paragraphs (d)(2) and (3) of §2.99 codify existing practice on who must file an answer to a notice of institution of a concurrent use proceeding and the effect of not filing an answer.

Section 2.99(e) codifies existing practice on the order of the parties and the burden of proof and states who is the junior party if two applications have the same filing date but different dates of execution. A person specified as an excepted user but who has not filed an application is stated to be a senior party to every party that has an application involved in the proceeding because a party without an application is seeking no relief and therefore has no burden of proving entitlement to relief.

Section 2.99(f) provides for the issuance of a concurrent use registration upon the basis for a court's determination of the rights of the parties to use their marks in commerce, without the institution of a proceeding by the TTAB, when all of the conditions specified in the rule are fulfilled. The first clause in paragraph (f), which, as proposed, read "when a concurrent use registration is sought on the basis of a court's determination of the rights of the parties to use the marks in commerce, * * *", has been modified herein to read "When a concurrent use registration is sought on the basis that a court of competent jurisdiction has finally determined that the parties are entitled to use the same or similar marks in commerce, * * *." The modified clause closely follows the language of that portion of section 2(d) of the Act of 1946 upon which the rule is based. The modification has been made in order to clarify the subsection and is not considered to result in a material alteration thereof.

Section 2.99(g) codifies existing law that registrations and applications to register on the Supplemental Register and registrations under the Act of 1920 are not subject to concurrent use registration proceedings and implements section 26 of the Act of 1946, which provides, inter alia, that applications for and registrations on the Supplemental Register shall not be subject to section 17 of the Act, which is the statutory authority for a concurrent use registration proceeding (cf. existing §2.91(b)).

Section 2.104 is amended to clarify existing §2.104.

Section 2.105 is amended to clarify existing §2.105 and codify the practice thereunder.

Section 2.106(c) is amended to codify the practice under existing §2.106(c) that, after an answer is filed, an opposition may be withdrawn without prejudice only with the written consent of the applicant.

Section 2.107 is amended to codify the practice under existing §2.107 whereby any pleading, including the answer, may be amended.

Section 2.113 is amended to clarify existing §2.113, which described the procedure for notifying a registrant of the filing of a proper petition for cancellation of his registration. The amended section includes cross-refer-

ences to §§2.111 and 2.112 (amended effective Feb. 27, 1983), which pertain to the "filing" of and proper form for a petition for cancellation, and to §2.118, which pertains to undelivered Office notices.

Section 2.115 is amended to codify the practice under existing §2.115 whereby any pleading, including the answer, may be amended.

Section 2.116(b) is amended to clarify the language and intent of existing §2.116(b).

Section 2.116(c) is amended to clarify existing §2.116(c). Any complaint filed by a party in an interference or concurrent use proceeding would be a petition for cancellation, and the position of the parties in the consolidated proceeding will be set by the TTAB as required.

Section 2.117 is amended by designating the present section as paragraph (a) and adding two new paragraphs, (b) and (c). Section 2.117 as proposed contained four subsections. Proposed paragraph (b) is withdrawn and proposed paragraphs (c) and (d) are redesignated (b) and (c).

Section 2.117(b) codifies existing practice as to determination of a potentially dispositive motion when the question of suspension of proceedings is raised.

Section 2.117(c) permits a party to move, or parties to stipulate, for suspension, which usually occurs when negotiations for settlement are undertaken and the parties want proceedings suspended for that purpose.

Section 2.120 is amended in several respects, commencing with a reorganization of the rule to state how discovery may be taken, then how discovery may be compelled, then how admissions may be requested and the sufficiency of admissions or objections to requests therefor may be tested, and then how the results of discovery may be used in a proceeding.

Section 2.120(a) clarifies the language of the introductory paragraph of existing §2.120.

Section 2.120(b) clarifies existing §2.120(a)(1) and codifies the practice thereunder, and is made applicable to domestic parties.

Section 2.120(c)(1) restates in modified form the provisions of existing §2.120(a)(2), and in addition, permits oral discovery depositions in foreign countries on motion for good cause or by stipulation of the parties.

Section 2.120(c)(2) provides for oral discovery depositions within the United States of foreign parties or their officers, etc. if they will be in the United States during a discovery period.

Section 2.120(d) makes specific provision for requests for production and codifies the practice for this kind of discovery.

Section 2.120(e) clarifies existing §2.120(c)(1) and codifies the practice on motions to compel discovery.

Section 2.120(f) adds provisions pertaining to protective orders during discovery.

Section 2.120(g) clarifies existing §2.120(c)(2) and further codifies the practice on sanctions for failing to obey orders pertaining to discovery.

Section 2.120(h) adds to the discovery rules provisions pertaining to requests for admissions and codifies the practice pertaining to requests for admissions.

Section 2.120(i) codifies the practice on the use of telephone and pre-trial conferences to resolve disputes.

Section 2.120(j) clarifies existing §2.120(a)(3) relating to the use of discovery depositions, and codifies and revises the practice on the filing with the TTAB of matter obtained during discovery and the use thereof at trial.

Section 2.121 clarifies existing §2.121 and codifies the practice thereunder.

Section 2.122 consolidates in one section the rules governing the introduction and admission of certain types of evidence in inter partes proceedings before the TTAB.

Section 2.122(a) identifies the sources of the law of evidence to be applied in inter partes proceedings.

Section 2.122(b)(1) clarifies the language and codifies the practice under existing §2.122(a).

Paragraph (b)(2) and paragraph (c) of §2.122 clarify existing §2.126 and codify the practice under that section.

Section 2.122(d)(1) incorporates all of the substance of existing §2.122(b) relating to the introduction in evidence of a plaintiff's pleaded registration with the complaint, except that the provision permitting the submission of an order for status and title copies of a pleaded registration with the complaint has been eliminated.

Section 2.122(d)(2) provides for the introduction in evidence of a registration owned by a party to a proceeding during the taking of testimony or by the filing of a notice of reliance on the registration, together with status and title copies thereof, during that party's testimony period.

Section 2.122(e) [identified in the notice of proposed rulemaking as §2.122(c)(1)] clarifies and adds to the provisions of existing §2.122(c) relating to printed publications and official records. Section 2.122(e) requires that an official record or copy thereof offered under the rule be an authentic record or copy pursuant to the Federal Rules of Evidence and also requires that, when a copy of a relevant portion of a printed publication is offered, the copy include the title page and any other page needed to show the place and date of publication, the name and address of the publisher, and the name of the author or the editor, which information is intended to enable the party against whom the evidence is offered to identify what it is. In the proposed and final rules, a new phrase, namely, "among members of the public or that segment of the public which is relevant under an issue in a proceeding", has been added to the opening clause of existing §2.122(c), so that that clause now reads "Printed publications, such as books and periodicals, available to the general public in libraries or of general circulation among members of the public or that segment of the public which is relevant under an issue in a proceeding". The phrase was added so that it would be clear that a trade journal, for example, is a printed publication of the type contemplated by the rule notwithstanding the fact that it may be circulated only among members of the trade rather than among members of the general public; the addition is not to be construed as an indication that an individual company's promotional literature, product booklets, annual reports, etc., are admissible under this section. Cf. Glamorene Products Corporation v. Earl Grissmer Company, Inc., 203 USPQ 1090 (TTAB 1979); Litton Industries, Inc. v. Litronix, Inc., 188 USPQ 407 (TTAB 1975); and Minnesota Mining and Manufacturing Company v. Stryker Corporation, 179 USPQ 433 (TTAB 1973).

Section 2.122(f) clarifies existing §2.122(d) and codifies the practice thereunder.

Section 2.123 is amended by revising paragraphs (a), (e)(3), (j), and (k) thereof.

Section 2.123(a)(1) provides that testimony may be taken by depositions upon oral questions or upon written questions and further provides that if a party serves a notice of taking a testimonial deposition upon written questions, any adverse party may move to have the deposition taken upon oral questions if the witness, even though he may be a foreign party or a person who usually resides in a foreign country, is, or at the time of the deposition will be, in the United States or any territory under the control and jurisdiction of the United States.

Section 2.123(a)(2) provides that testimony in a foreign country is ordinarily to be taken by a deposition upon written questions but that the party against whom a testimonial deposition will be taken may move for good cause shown to have it taken by oral questions in a foreign country, and further provides that the parties may stipulate to have testimony taken by an oral deposition in a foreign country.

Section 2.123(e)(3) codifies the practice that a party who did not receive a proper notice of the taking of a deposition with respect to any witness may cross-examine that witness under protest while preserving his right to move to strike the whole of the testimony of that witness.

Section 2.123(j) is revised to provide that Rule 32(d)(1), (2), and (3) (A) and (B) of the Federal Rules of

Civil Procedure shall apply to errors and irregularities in depositions; that notice will not be taken of merely formal or technical objections which shall not appear to have wrought a substantial injury to the party raising them; and that in case of such injury it must be made to appear that the objection was raised at the time specified in the aforesaid rule.

Section 2.123(k) is revised to provide that objections to the competency of a witness or to the competency, relevancy, or materiality of testimony must be raised at the time required by Rule 32(d)(3)(A) of the Federal Rules of Civil Procedure, and that such objections will not be considered until final hearing.

Section 2.124 sets out the procedure to be followed in taking a discovery deposition or a testimonial deposition upon written questions.

Section 2.124(a) provides that a deposition upon written questions may be taken before any of the persons described in Rule 28 of the Federal Rules of Civil Procedure.

Section 2.124(b)(1) provides for the kind of notice which must be served by a party desiring to take a testimonial deposition upon written questions and further provides that a copy of the notice, without the questions, must be filed with the TTAB.

Section 2.124(b)(2) provides for the kind of notice which must be served by a party desiring to take a discovery deposition upon written questions and further provides that a copy of the notice, without the questions, must be filed with the TTAB. This paragraph also provides that, if the name of the person to be deposed is not known to the party who will take the deposition, a general description sufficient to identify the class or group to whom the prospective witness belongs shall be stated in the notice and the party to be deposed shall designate one or more discovery witnesses.

Section 2.124(c) requires that every notice of deposition upon written questions name or describe by title the officer before whom the deposition will be taken.

Section 2.124(d)(1) specifies the procedure and timetable for serving the questions, objections, and substitute questions for a deposition upon written questions.

Section 2.124(d)(2) provides that the TTAB may reset the times specified in §2.124(d)(1) and, when a testimonial deposition is to be taken upon written questions, shall suspend or reschedule other proceedings in the matter to allow for the completion of the deposition.

Section 2.124(e) provides the procedure for sending the notice and questions to the officer designated in the notice, the taking of the deposition, and the certification and mailing of the transcript to the party who took the deposition.

Section 2.124(f) provides for the service of copies of the transcript and exhibits, states that the party who took the deposition is responsible for the correctness of the transcript, permits the use of a discovery deposition as provided by §2.120(j), and provides for the filing with the TTAB of a testimonial deposition, a copy thereof, and the exhibits.

Section 2.124(g) states that objections to questions and answers may be considered at final hearing.

Section 2.125(a) provides for the service of a transcript of an oral testimonial deposition and the exhibits, and, in respect of that requirement, continues the rule of existing §2.125(a).

Section 2.125(b) makes the party who took a deposition responsible for its correctness and for serving the adverse party with a corrected transcript or corrected pages.

Section 2.125(c) continues the requirement of existing §2.125(a) that a certified transcript and the exhibits be filed promptly with the TTAB and further provides that notice of filing be served on the adverse party and that a copy of the notice be filed with the TTAB. The requirement for the filing of a copy of the transcript (in addition to the certified transcript), which appeared both in existing §2.125(a) and in proposed §2.125(c), has not been retained in the final rule since the TTAB does not really need the copy and the printing of it is an unnecessary expense for parties involved in proceedings before the TTAB.

Section 2.125(d) continues the requirements of existing §2.125(b).

Section 2.125(e) provides that the TTAB, on motion, may order that any part of a deposition transcript or exhibits that directly disclose a trade secret or other confidential research, development, or commercial information may be filed under seal and kept confidential and provides for sanctions for failure to comply with the order.

Section 2.126 is deleted because the substance of the existing section has been shifted to §2.122(b)(2) and (c).

Paragraphs (a), (b), and (c) of §2.127 clarify, and codify the practice under, existing paragraphs (a), (b), and (c) of that section.

Section 2.127(d) codifies the practice with respect to suspending all matters in a case not germane to a potentially dispositive motion until the determination thereof.

Section 2.128(a)(1) clarifies existing §2.128(a) except that the rule requiring copies of a brief is shifted to final §2.128(b).

Section 2.128(a)(2) codifies the practice of having the TTAB set the briefing schedule by order when proceedings are consolidated, or when there is a counterclaim, or when more than two parties are involved.

Section 2.128(a)(3) contains a new provision enabling the TTAB to enter judgment against a plaintiff who fails to file a brief at final hearing and also fails to respond to an order to show cause why such judgment should not be entered against him or files a response indicating that he has lost interest in the case.

Section 2.128(b) clarifies and codifies the practice under the last sentence of existing §2.128(a) and existing §2.128(b).

Section 2.129(a) clarifies and codifies the practice under existing §2.128(c) and existing §2.129(a).

Section 2.129(b) clarifies existing §2.129(b).

Section 2.129(c) clarifies existing §2.129(c), from which the language referring to a decision on a motion which is finally dispositive of a case has been deleted because any requests for reconsideration or modification of a decision issued on a motion would be made under final §2.127(b).

Section 2.131 clarifies and codifies the practice under existing §2.131. The effect is to eliminate the dichotomy between inter partes and ex partes issues and to provide for the determination by the TTAB of all issues that have been expressly pleaded by the parties or tried by their express or implied consent and to reserve for remand to the examiner for reexamination only issues neither pleaded nor tried but which appear to make the mark of an applicant unregistrable.

Section 2.132(a) changes the practice under existing §2.132(a) by eliminating the step of having the TTAB issue an order to the plaintiff to show cause why judgment should not be entered against him. Under amended §2.132(a), the plaintiff will have fifteen days from the date of service of the defendant's motion for dismissal within which to show cause why judgment should not be rendered against the plaintiff.

Section 2.132(b) clarifies existing §2.132(b).

Section 2.134(a) codifies the practice under existing §2.134 that the written consent of the adverse party is required to avoid judgment against a cancellation respondent who applies to cancel his registration under section 7(d) of the Act of 1946 while the registration is involved in a proceeding.

Section 2.134(b) provides that, after the commencement of a cancellation proceeding, if it comes to the attention of the TTAB that a respondent (registrant) has permitted his registration to be cancelled under section 8 of the Act of 1946 or has failed to renew his registration under section 9 of the Act, an order may be issued allowing respondent until a set time in which to show cause why the resulting demise of the registration should not be deemed to be the equivalent of a cancellation of the registration by request of the repondent without the written consent of the adverse party and should

not result in entry of judgment against the respondent; and that, in the absence of a showing of good and sufficient cause, judgment may be entered against respondent. Section 2.134(b) is added to avoid situations where a respondent in a cancellation proceeding may moot the case and avoid judgment because of the fortuitous circumstance that his registration happens to reach its sixth anniversary or twentieth anniversary while a proceeding is pending and the respondent exploits this situation by simply failing to file an affidavit under section 8 of the Act or a renewal application under section 9 of the Act.

Section 2.135 codifies the practice under existing §2.135, which is parallel to the practice under existing §2.134 and final §2.134(a), that the written consent of the adverse party is required to avoid judgment against an applicant who abandons his application or mark while the application is involved in an opposition, concurrent use or interference proceeding. It should be noted that existing §2.135 begins, "If, in a proceeding, an applicant * * *", but that the section as proposed referred only to "an opposition proceeding". The narrowing of the application of the rule in the section as proposed was an inadvertent error. In order to correct the error, the proposal to revise the section to include only a reference to an opposition proceeding is withdrawn. The wording of the beginning of final §2.135, namely, "After commencement of an opposition, concurrent use, or interference proceeding, if the applicant * * *", is legally equivalent to the beginning of existing §2.135.

Section 2.142(a) clarifies existing §2.142(a).

Section 2.142(b) requires the examiner to file with the TTAB a brief answering the appellant's brief and requires the examiner to file the brief within sixty days after appellant's brief is sent to the examiner by the TTAB. Section 2.142(b) as proposed required that the examiner's brief (referred to therein as a "statement") answer "every point in" the appellant's brief, whereas existing §2.142(b) requires only that the examiner furnish a written statement "In answer to" appellant's brief. Upon further consideration, the proposal to modify §2.142(b) to require that the examiner's brief answer "every point in" the appellant's brief is withdrawn since it is likely to result in briefs which are unduly lengthy. An appellant's brief may contain points which are so insignificant, immaterial, etc. as to require no response.

Section 2.142(c) codifies the practice that all requirements made by the examiner and not the subject of appeal shall be complied with prior to the filing of an appeal.

Section 2.142(d) provides that the record in the application should be complete prior to the filing of an appeal, states that the TTAB will ordinarily not consider additional evidence filed with the TTAB by the appellant or by the examiner after an appeal is filed, and provides that either the appellant or the examiner may request the TTAB to suspend the appeal and remand the application for further examination if the appellant or the examiner desires to introduce additional evidence.

Section 2.142(e)(1) amends existing §2.142(c), and codifies the practice under the existing rule, by changing the due date for a request for an oral hearing on an appeal from the date when the appellant's brief is filed to a date ten days after the due date for a reply brief.

Section 2.142(e)(2) requires the examiner to present an oral argument if an oral argument is requested by the appellant.

Section 2.142(e)(3) allots twenty minutes to the appellant for oral argument and ten minutes to the examiner for oral argument.

Section 2.142(f) provides for situations where, during an appeal, it appears to the TTAB that an issue not previously raised may render the mark of the appellant unregistrable, that is, when something on the face of the record on appeal indicates that a question concerning the registrability of the mark may exist but has not been considered. The paragraph provides the procedure to be followed by the TTAB, the Examiner, and the appellant when the TTAB suspends an appeal and remands an application on the TTAB's own initiative. The paragraph as amended includes certain words, namely, "to be completed", appearing in the phrase "and remand the application to the examiner for further examination to be completed within thirty days", which were not included in the paragraph as proposed. The words have been added in order to further clarify the intent of the paragraph and are not considered to result in a material alteration thereof. Further, for the reason indicated in connection with §2.142(b), the words "every point in" have been omitted from §2.142(f)(4).

Section 2.146 collects in one section the rules on petitions to the Commissioner in existing §§2.146, 2.147, and part of §2.148. For this reason existing §2.147 is removed. In the notice of proposed rulemaking, it was also proposed that existing §2.148 be deleted. The reason for the proposal was a belief that the entire substance of §2.148 was incorporated in proposed §2.146(a)(5), which provides that petition may be taken to the Commissioner in any extraordinary situation, when justice requires and no other party is injured thereby, to request a suspension or waiver of any requirement of the rules not being a requirement of the Act of 1946. However, existing §2.148 provides that in an extraordinary situation, when justice requires and no other party is injured thereby, any requirement of the rules not being a requirement of the statute may be suspended or waived by the Commissioner. That rule is not limited to waiver petition but rather also encompasses waiver upon the Commissioner's own initiative. Inasmuch as the entire substance of existing §2.148 is not incorporated in proposed and final §2.146(a)(5), the proposal to remove §2.148 is withdrawn.

Section 2.146(a) reflects the change in §2.63(b) permitting petitions concerning some requirements which have been made final.

Section 2.146(b) delineates classes of questions which are not considered to be appropriate subject matter for petitions to the Commissioner. These questions are substantive issues of registrability of marks and are considered to be appropriate for appeal to the TTAB. Section 2.146(b) as proposed read "Questions arising under Sections 2, 3, 4, 5, 6 and 23 of the Trademark Act during the ex parte prosecution of applications are not considered to be appropriate subject matter for petitions to the Commissioner", whereas paragraph (b) as adopted herein reads "Questions of substance arising during the ex parte prosecution applications, including, but not limited to, questions arising of under Sections 2, 3, 4, 5, 6 and 23 of the Act of 1946, are not considered to be appropriate subject matter for petitions to the Commissioner." The wording of the paragraph has been modified for purposes of clarification, and such modification is not considered to result in a material alteration of the paragraph.

Section 2.146(c) specifies the contents of a petition of the Commissioner, and in this respect clarifies requirements previously included in §2.146(b).

Section 2.146(d) specifies the time limit for filing a petition on any matter not otherwise specifically provided for. In proposed §2.146(d), an attempt was made to list the matters otherwise specifically provided for. However, several matters were inadvertently omitted. In order to ensure that the rule is correct, the list has been omitted from the final rule.

Section 2.146(e) provides time limits and specifies the procedure for a petition to the Commissioner from the denial of a request for an extension of time to file an opposition or from an interlocutory order of the TTAB. Section 2.146(e)(1) contains a new requirement that a petition from the denial of a request for an extension of time to oppose must be served on the applicant or his attorney and provides for a response by the applicant to the petition.

Section 2.146(f) clarifies a provision previously included in §2.146(c).

Section 2.146(g) clarifies and codifies the practice previously under §2.146(d) and, in addition, makes §2.146 consistent with §§2.63(b) and 2.65, as adopted herein.

Section 2.146(h) codifies the practice previously under

§2.146(e) whereby authority to act on classes of petitions, in addition to any particular petition, may be delegated.

Paragraphs (a), (b), and (c) of §2.165 specify the procedure when the affidavit or declaration filed under section 8 of the Act of 1946 is refused. The steps to be taken by the registrant to request reconsideration and to petition to the Commissioner and the time limits for such requests and petitions are stated.

Section 2.165(d) states that a petition to the Commissioner for review of the action refusing the affidavit or declaration under section 8 of the Act of 1946 shall be a condition precedent to an appeal to or action for review by any court. This implements section 21 (a)(1) and (b)(1) of the Act, which provides, inter alia, that a registrant who has filed an affidavit under section 8 of the Act who is dissatisfied with the decision of the Commissioner may appeal to the U.S. Court of Appeals for the Federal Circuit or may have remedy by a civil action.

Section 2.173(b) clarifies the circumstances in which an amendment of the identification of goods or services of a registration is permitted. The rule states that an identification of goods or services can be restricted or can be otherwise changed in ways that would not require republication of the mark.

Paragraphs (a), (b), and (c) of §2.184 specify procedures and time limits for relief when an application for renewal of the registration under section 9 of the Act of 1946 is refused, in parallel with final §2.165.

Section 2.184(d) is parallel to final §2.165(d) and has the same statutory basis.

Section 2.186 clarifies and codifies the practice under existing §2.186 that action with respect to an assigned application or registration may be taken by the assignee provided that the assignment has been recorded.

**Response to Comments on the Rules**

The written comments and oral testimony offered in response to the notice of proposed rulemaking published in the **Federal Register** on June 29, 1982 have been given careful consideration, and a substantial number of the suggested modifications have been adopted. The comments and responses (except those pertaining to §§2.101, 2.102, 2.103, 2.111, and 2.112, which were included in the final rule notice published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972) appear below:

*Comment:* In response to the proposal to amend §2.20 by adding a new paragraph (b) to codify a particular practice relating to the verification of oppositions and petitions for cancellation, one organization noted that the question of verification of oppositions and petitions for cancellation appeared to be moot in view of Pub. L. 97-247; indicated its belief, with respect to the phrase "person who is authorized to sign" in proposed §2.20(b), that the rules pertaining to oppositions and petitions for cancellation should be amended to require that when an opposition or petition for cancellation is signed on behalf of a corporation or an association by a person who is authorized to sign the document but who is not an officer, the person must represent that he has such authority; and submitted its proposal for a substitute §2.20 (modeled on the corresponding patent rule, §1.68) which is broader in scope than present §2.20.

*Response:* Inasmuch as Pub. L. 97-247 has amended the Trademark Act of 1946 so as to eliminate the requirement for verification of oppositions and petitions for cancellation, the proposal to amend §2.20 by adding a new paragraph (b) relating to verification of oppositions and petitions for cancellation has been withdrawn. The other two suggestions involve substantive rule changes which are outside the scope of the proposed rule changes as published and hence cannot be adopted without affording members of the public an opportunity to comment thereon. However, these suggestions will be considered in connection with any future proposals to amend the rules in question. In this regard, it should be noted that when an opposition or petition for cancellation is signed by a person whose authority to sign is not apparent, it is the practice of the Trademark Trial and Appeal Board to inquire as to that person's authority to sign.

*Comment:* One organization suggested that the word "Anything" be substituted in proposed §2.27(e) for the phrase "Any documents, tangible things, answer to interrogatories, or all or any part of any discovery or testimonial deposition transcripts" because the attempt to list all of the types of things subjected to the rule might invite disputes as to whether particular items are covered. The same organization suggested that the following sentence be added to paragraph (e): "When possible, only confidential portions of filings with the Board shall be filed under seal."

Response: The paragraph has been modified as suggested.

*Comment:* One organization and three members of another organization suggested that proposed §2.64(b), which concerns requests for reconsideration after final action by the examiner, be modified to require that any request for reconsideration filed within three months of the final action be responded to by the examining attorney before the time for appeal.

*Response:* The six-month period for appealing from a final refusal of registration, or for complying with a requirement which has been made final, or for petitioning the Commissioner [if permitted by §2.63(b)] with respect to such a requirement, is statutory, and the Patent and Trademark Office cannot guarantee that any request for reconsideration filed within three months of the final action will be responded to by the examining attorney before the time for appeal. However, the paragraph has been modified to provide that normally the examiner will reply to a request for reconsideration before the end of the six-month period if the request is filed within three months after the date of the final action.

*Comment:* Two organizations expressed disapproval of the final sentence of proposed §2.64(b), which reads: "Amendments accompanying requests for reconsideration after final action will be entered if they place the application in condition for publication or in better form for appeal." The organizations criticized this provision as being unduly restrictive and vague, and suggested that the subsection be modified to permit any amendment that complies to the Trademark Act of 1946 and the Rules of Practice in Trademark Cases.

*Response:* The paragraph has been modified as suggested.

*Comment:* One organization suggested that proposed §2.65(a), which includes a reference to proposed §2.63(b), be modified to include also a reference to proposed §2.146, for the asserted reason that if reference is made to other sections of the rules, the reference should include all the most pertinent rules.

*Response:* The Paragraph has been modified as suggested.

*Comment:* Two organizations urged with respect to proposed §2.65(b) (which concerns the filing of an incomplete response to an examiner's action), that the word "may" in the clause "opportunity to explain and supply the omission may be given before the question of abandonment is considered" be changed to "shall".

*Response:* The suggestion has not been adopted. A requirement that an opportunity to explain and supply an omission be given in every case would result in a significant increase in the work load of the Trademark Examining Operation and hence an undue burden upon the Patent and Trademark Office. Accordingly, the word "may" has been retained in the final paragraph so as to leave the Trademark Examining Attorney with the descretion to determine whether such an opportunity should be given, depending upon the nature of the omission. The final paragraph parallels corresponding patent §1.135(c).

*Comment:* One member of one of the organizations commented that as a result of the proposed revision of §2.72 (which would allow non-material changes in the drawing of a mark to be supported by specimens which were not necessarily in use at the time the original application was filed), an applicant might amend its mark

sought to be registered in order to overcome a reference under section 2(d) of the Trademark Act of 1946.

*Response:* The proposed revision might well have the result suggested in the comment, and an amendment for such a purpose would not be wrong, in and of itself. However, upon further consideration it appears that the proposed revision might result in so many amendments to marks as to constitute a burden upon the Patent and Trademark Office. Accordingly, the proposal to revise §2.72 in the manner described above is withdrawn. A second proposal to change the last sentence of §2.72 from "Amendments may not be made if the nature of the mark is changed thereby." to "Amendments may not be made if the character of the mark is materially altered.", so that the standard for amendment will be the same as the standard for amendment of registered marks (see section 7(d) of the Act of 1946), is adopted.

*Comment:* One organization commented, with respect to proposed §2.81, that there is a typographical error in the first line of the section, namely, that "with" should be "within." Another organization noted certain errors in the corrections to proposed §2.121(b)(1) and (c) published in the **Federal Register** at 47 FR 32955.

*Response:* The noted errors were made in printing. They do not appear in the original text of the notice of proposed rulemaking which was prepared and retained by the Patent and Trademark Office.

*Comment:* One individual, one organization, and one member of another organization expressed their belief that the second sentence in proposed §2.99(a) (which states, "The examiner may require an applicant for registration as a concurrent user to make a prima facie showing that the applicant is entitled to a concurrent use registration") is too vague to be of help in drafting a concurrent use application, and suggested that this portion of the paragraph either be deleted or made more specific.

*Response:* Upon further consideration, it appears that the subject matter of this portion of the subsection should be developed either through decisional law or in the Trademark Manual of Examining Procedure. Accordingly, the sentence has been deleted.

*Comment:* Proposed §2.99(f) lists the conditions which must be met when an applicant seeks to obtain a concurrent use registration under the provisions of section 2(d) of the Act of 1946 based on a court decree, without the necessity of a concurrent use proceeding in the Patent and Trademark Office. One organization urged that the fifth condition (which states: "the excepted use specified in the concurrent use application does not involve a registration") be deleted for the reason that it is vague and, in any event, inappropriate where the registration involved was otherwise before the court.

*Response:* When the excepted use specified in a concurrent use application based on a court decree involves an unrestricted registration, a concurrent use registration proceeding must be instituted in order that the Trademark Trial and Appeal Board may restrict the registration in accordance with the court decree. In such cases, the concurrent use registration proceeding does not go forward to trial but rather is terminated on the basis of the court decree immediately after institution of the proceeding. However, if the registration has been restricted by the Commissioner in accordance with the court decree, and the other conditions listed in paragraph (f) have been met, there is ordinarily no need for a concurrent use registration proceeding. Accordingly, paragraph (f) has been modified to read: "the excepted use specified in the concurrent use application does not involve a registration, or any involved registration has been restricted by the Commissioner in accordance with the court decree."

*Comment:* One organization noted that in §§2.104 and 2.105, as proposed, the term "opposition", when used to refer to the complaint in an opposition proceeding, has been changed to "notice of opposition". The organization expressed its belief that there is no reason for reverting to the phrase "notice of opposition" except tradition, and that that phrase is confusingly similar to the phrase "notification of opposition".

*Response:* The proposal to change "opposition" to "notice of opposition" in certain instances has not been adopted.

*Comment:* One organization commented that proposed §2.113 should be modified to indicate that the effective filing date of a petition for cancellation will be the date that the statutory requirements, including payment of the required fee(s), are satisfied. The organization indicated that it was concerned here and elsewhere (see comment and response pertaining to §2.111 in the final rule notice published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972) about cases in which an incomplete filing is made within five years of the date of registration and not perfected until the five-year period of section 14(a) of the Act of 1946 has passed. The organization also suggested that the section be modified to include a cross-reference to existing §2.118, which pertains to undelivered notifications.

*Response:* The section has been modified to include a cross-reference to §2.118. Additionally, the first clause in the section, which as proposed read "When a petition for cancellation has been filed in proper form and the correct fee(s) have been submitted,", has been modified by the inclusion of a cross-reference to §§2.111 and 2.112 and by the deletion of the words "and the correct fee(s) have been submitted,", so that the modified clause reads "When a petition for cancellation has been filed in proper form (see §§2.111 and 2.112),". Section 2.111, as amended effective Feb. 27, 1983 (see the final rule notice published in the **Federal Register** on Jan. 28, 1983 at 47 FR 3972) provides in effect that the filing date of a petition for cancellation with respect to each named party petitioner and each class sought to be cancelled is the date of receipt in the Patent and Trademark Office of the petition together with the required fee for that party petitioner and class, and that is those cases where the five-year limitation of sections 14 (a) and (b) of the Acts of 1946 is applicable, the petition and required fee(s) must be filed prior to the expiration of the five-year period. Section 2.112, as amended effective Feb. 27, 1983, pertains to the proper form for a petition for cancellation.

*Comment:* One organization stated, with respect to proposed §2.117(b), that it failed to appreciate the necessity for requiring that issue be joined in both the civil action and the proceeding in the Patent and Trademark Office before the Trademark Trial and Appeal Board will consider suspension of the Board proceeding pending the outcome of the civil action. The organization also noted that the retained paragraph of §2.117 needs a paragraph reference, i.e., "(a)".

*Response:* The retained paragraph of §2.117 has designated been "a". Insofar as proposed paragraph (b) is concerned, it is not in fact the practice of the Board to require that issue be joined in the civil action before suspension of the Board proceeding will be considered [see Tokaido v. Honda Associates, Inc., 179 USPQ (TTAB 1973)]. Moreover, while it may not be possible in some cases to determine whether a civil action is likely to be determinative of a proceeding before the Board until an answer has been filed in one or both proceedings, in other cases it is feasible and advantangeous to suspend prior to answer. Accordingly, proposed §2.117(b) has been withdrawn, and proposed paragraphs (c) and (d) have been redesignated (b) and (c).

*Comment:* One organization suggested that suspension be considered automatic upon the showing of the institution of a civil action between the parties provided that the party in the position of plaintiff in the Board proceeding has neither commenced taking testimony nor filed any evidence in such proceeding.

*Response:* It is the normal practice of the Board to suspend under the circumstances outlined in the comment if it appears that the civil action may be dispositive of the proceeding before the Board. However, even under these circumstances there are times when it may be desirable to go forward with the Board proceeding, as, for example, when the civil court has a large backlog or

suspends its own action pending the final determination of the Board proceeding. Accordingly, it is believed that the matter of suspension should be left to the discretion of the Board, and the suggested amendment has not been adopted.

*Comment:* With respect to §2.117(b) [identified in the notice of proposed rulemaking as §2.117(c)], which as proposed reads "Whenever there is pending, at the time when the question of the suspension of proceedings is raised, a motion which is potentially dispositive of the case, the motion will be decided before the question of suspension will be considered.", one organization and two members of another organization suggested that the phrase "the motion will be decided" be changed to "the motion may be decided", so that the Board will have the discretion to either suspend or rule in such a case, and will not be compelled to determine the motion before it if, for example, a similar motion is pending in the civil action.

*Response:* The paragraph has been modified in accordance with this suggestion.

*Comment:* Four members of one organization objected to proposed §2.120(c)(2) (which provides in effect that whenever a foreign party or its officers, etc., is or will be in the United States during a discovery period, such party may be deposed in the United States by oral examination upon notice by the party seeking discovery.) The reason given for the objection was that the foreign officer could be seriously inconvenienced because of the proposed rule, which invites abuse.

*Response:* While it is true that a foreign officer who is traveling in the United States on other business might find it inconvenient to have his oral discovery deposition taken, it is equally true that there are instances in which it is inconvenient for a domestic officer to have his oral deposition taken. Further, there can be no doubt that the oral deposition is a far better discovery device than the deposition upon written questions. It is believed that the advantages offered by the oral deposition outweigh the disadvantage of possible inconvenience. Accordingly, proposed §2.120(c)(2) is being adopted herein as a final rule.

*Comment:* With respect to proposed §2.120(d), which provides for the production of documents, in response to a request for production of documents, at the place where the documents are usually kept, or where the parties agree, or where and in the manner which the Trademark Trial and Appeal Board, upon motion, orders, one individual suggested that the paragraph be modified to require that the party upon which the request is served respond to the request by sending copies of all documents requested to the party making the request.

*Response:* The purpose of §2.120(d) is to permit the Board, upon motion, to order that a party produce requested documents by photocopying and mailing them to the requesting party at the latter's expense. However, inasmuch as there are cases in which some other manner of production is more appropriate or feasible, the manner of production is a matter which is better left to the discretion of the Board. Accordingly, the suggestion has not been adopted.

*Comment:* One individual suggested that proposed §2.120(e), which concerns motions to compel discovery, be modified to provide that if counsel for the parties reach an agreement relating to a disputed discovery matter, a motion may be brought to enforce the agreement.

*Response:* Inasmuch as it is not the function of the Board to enforce agreements between parties, this suggestion has not been adopted. However, a party may always argue the existence of such an agreement as a factor bearing on the merits of a motion to compel discovery.

*Comment:* With respect to proposed §2.120(i) (which provides, in essence, that the Board may at its discretion request that the parties come to its offices for a pre-trial conference when pre-trial questions or issues have been so complex that their resolution by correspondence or telephone conference is not practical), one individual, noting that the paragraph provides for a pre-trial conference at the Board's option and discretion, suggested that the paragraph be modified to indicate that such a conference may also be requested by a party to a proceeding but that the Board be left with the discretion to grant the request. The same individual also suggested that the paragraph, which as proposed contains only a passing reference to a "telephone conference", be broken into two parts, the first being devoted to the telphone conference (with provision therefor at the option of the Board or at the request of a party to a proceeding, but again leaving the Board with discretion to grant the request), and the second being devoted to the pre-trial conference. The individual expressed his belief that attorneys should be made aware of the telephone conference procedure since it can be very useful to them as well as to the Board.

*Response:* The paragraph has been modified as suggested to include two paragraphs and to provide that the Board may utilize the telephone and pre-trial conference procedures either upon its own initiative or upon request made by one or both of the parties. Although neither of the new paragraphs contains the words "at its discretion," both contain the words "the Board may," which clearly indicate that the utilization of these procedures is a matter which is left to the discretion of the Board.

*Comment:* A number of comments were received with respect to proposed §2.120(j), which pertains to the use of discovery depositions, admissions, or answers to interrogatories. Two organizations noted that proposed §2.120(j)(2) (which incorporates the "fairness exception" of Rule 32(a)(4) of the Federal Rules of Civil Procedure ("F.R.C.P.") apparently limits the use of discovery depositions only to the inquiring party, while Rule 32(a)(4) F.R.C.P. allows the use of the deposition for any purpose by either party once the adverse party has relied upon any part of it. These organizations recommended that the paragraph be modified to follow Rule 32(a)(4) F.R.C.P. One organization objected to proposed §2.120(j)(3) (which permits the introduction into evidence on motion of the discovery deposition of a non-party under certain circumstances provided that the motion is filed promptly after the circumstances claimed to justify use of the deposition become known) on the ground that the timing requirement for the motion is unnecessary and unduly restrictive and that the better practice would be to let the motion be filed at the time of the purported offer of the deposition into evidence. Another organization recommended that consideration be given to permitting much greater use of non-party discovery depositions than permitted by proposed §2.120(j)(3), or at least that the burden imposed by the last of the listed instances in which such depositions may be introduced into evidence, namely, "upon a showing of extraordinary circumstances and necessity in the interest of justice", should be lessened. Three members of one organization commented that any party, not just the deposing party, should be able to make a discovery deposition of record if its use at trial is permitted by Rule 32 F.R.C.P. Finally, one individual noted that proposed §2.120(j), which permits only the inquiring party to introduce a discovery deposition into evidence (unless the "fairness exception" applies), conflicts with Rule 32(a)(2) F.R.C.P., which provides that a deposition of a party "may be used by an adverse party for any purpose", and with Rule 32(a)(3) F.R.C.P., which provides that the deposition of "a witness, whether or not a party, may be used by any party for any purpose" in the limited circumstances corresponding to those set forth in proposed §2.120(j)(3) (except for the 100-mile exception, which is not applicable to proceedings before the Trademark Trial and Appeal Board). This individual submitted a suggested alternative text for §2.120(j) which conforms to Rule 32(a) F.R.C.P. by (a) eliminating the restriction in proposed §2.120(j)(1) and (2) that only the inquiring party may offer a discovery deposition in evidence, and (b) broadening proposed §2.120(j)(2) to cover any "witness, whether or not a party". In the suggested text,

paragraphs (1)–(3) of proposed §2.120(j) are also reorganzied and rearranged for clarity.

*Response:* The text suggested by the individual has been adopted with certain modifications in order to resolve the conflicts and objections noted by this individual and others, as outlined above. In the final paragraph, the text of §2.120(j)(1) follows the text of Rule 32(a)(2) F.R.C.P. The text of the discovery deposition "fairness exception", which appears in final §2.120(j)(4), is essentially the same as the text of Rule 32(a)(4) F.R.C.P. The provision relating to the introduction into evidence, by order of the Board upon motion, of the discovery deposition of a non-party under certain circumstances [which appears in final §2.120(j)(2)] has been broadened to permit the introduction, by order of the Board upon motion, of the discovery deposition of a witness, whether or not a party, by any party under the stated circumstances. The final such circumstance, which in the proposed paragraph read "upon a showing of extraordinary circumstances and necessity in the interest of justice", has been modified to read "upon a showing that such exceptional circumstances exist as to make it desirable, in the interest of justice, to allow the deposition to be used," which closely follows the wording of Rule 32(a)(3) F.R.C.P. The timing requirement for a motion filed under the paragraph has been changed from "filed promptly after the circumstances claimed to justify use of the deposition became known" to "filed at the time of the purported offer of the deposition in evidence" for all such motions except those based upon a claim of exceptional circumstances. In the latter instance, the proposed timing requirement, namely, "filed promptly after the circumstances claimed to justify use of the deposition became known", has been retained in the final rule for two reasons; first, to provide an adverse party with the best possible opportunity to investigate the claim of exceptional circumstances, and second, so that in those cases where the circumstances become known prior to the taking of the deposition, the motion will be filed, and hence can be determined, before the deposition is taken. Finally, in order to make it clear that once a discovery deposition, or a part thereof, or an answer to an interrogatory, or an admission, has been properly made of record by one party, it may be referred to by any party for any purpose permitted by the Federal Rules of Evidence, a provision to that effect, identified as paragraph (j)(7), has been included in the final paragraph.

*Comment:* With respect to proposed §2.122(c)(2) (which provides that a registration owned by a party to a proceeding may be made of record by that party by filing a notice of reliance accompanied by a certified copy of the registration showing current status and title), two organizations and three members of another organization objected to the requirement for certification of the status and title copies as being unnecessary, expensive, and unduly harsh. One of these organizations, noting that proposed §2.122 is modified to eliminate the practice set forth in existing §2.122(b) (which provides that a registration of an opposer or petitioner pleaded in an opposition or petition to cancel will be received in evidence and made part of the record if two copies showing status and title of the registration or an order for such copies accompany the opposition or petition), expressed its belief that, accepting the Patent and Trademark Office's position that the practice set forth in existing §2.122(b) has caused delays and problems for the Office, still there is no reason for requiring that the status and title copies of the registration be certified when made of record, pursuant to proposed §2.120(c)(2), by the filing of a notice of reliance during the testimony period of the party filing the notice.

*Response:* The proposal to require that status and title copies of registrations also be certified has not been adopted herein. Further, since the only part of existing §2.122(b) which caused trouble was the provision involving the submission of an *order* for status and title copies with the complaint, the proposal to modify existing §2.122 by eliminating that provision is adopted herein, but the proposal to eliminate the provision involving the submission of actual status and title copies with the complaint is withdrawn. Hence, final §2.122 provides, in paragraph (d)(1), that a registration of the opposer or petitioner pleaded in an opposition or petition to cancel will be received in evidence and made part of the record if the opposition or petition is accompanied by two copies of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration.

*Comment:* One organization suggested that the word "competent" should be inserted before the word "evidence" in two (unspecified) places in proposed §2.122-(b)(2) and in one place in proposed §2.122(b)(3), and that the first clause in proposed §2.122(c)(2) be changed from "A registration owned by any party to a proceeding may be made of record in the proceeding by that party by filing a notice of reliance," to "A registration owned by any party to a proceeding may be made of record in the proceeding by that party by appropriate identification and introduction during the proper testimony period or by filing a notice of reliance,". The same organization also submitted a suggested plan for reorganizing proposed §2.122 and for giving each paragraph therein a heading. Three members of another organization expressed their agreement with these suggestions.

*Response:* The suggested plan for reorganization and for headings has been adopted herein with certain minor modifications necessitated by the response to the foregoing comment (e.g., the comment concerning the introduction of registrations in evidence).

The word "competent" has been inserted before the word "evidence" only once in final §2.122(b)(2) and not at all in final §2.122(c) [identified in the notice of proposed rulemaking as §2.122(b)(3)]. The clauses in these paragraphs were the word "competent" might have been, but was not, inserted before the word "evidence" read "The allegation in an application for registration, or in a registration, of a date of use is not evidence on behalf of the applicant or registrant;"; "Specimens in the file of an application for registration, or in the file of a registrant, are not evidence on behalf of the applicant or registrant * * *"; and "An exhibit attached to a pleading is not evidence on behalf of the party to whose pleading the exhibit is attached * * *" The reason why the word "competent" was not inserted in these instances is that in each one the matter in question is not evidence *on behalf of the named party* at all (although specimens, or the allegation of a date of use, for example, may be used as evidence against an applicant or registrant, e.g., as an admission against interest).

Finally, the first clause in proposed §2.122(c)(2) [identified herein as §2.122(d)(2)] has been modified to read "A registration owned by any party to a proceeding may be made of record in the proceeding by that party by appropriate identification and introduction during the taking of testimony or by filing a notice of reliance."There is a slight difference between the clause as adopted and the clause as suggested by the organization (the organization's suggested wording "during the proper testimony period" has been changed to "during the taking of testimony"). The change in the wording was made so that it would be clear that this portion refers to identification and introduction during the taking of testimony as distinguished from identification and introduction by notice of reliance. This change is not to be construed as an indication that such identification and introduction does not have to be made "during the proper testimony period"; with the deception of status and title copies of a plaintiff's pleaded registration submitted with the complaint, any evidence which a party offers on the case must be offered during the proper testimony period.

*Comment:* With respect to proposed §2.123(a)(1) (which provides, inter alia, that if a party serves notice of the taking of a testimonial deposition upon written questions of a witness within the United States, any adverse party may, within fifteen days from the date of service of the notice, file a motion with the Trademark

Trial and Appeal Board, for good cause, for an order that the deposition be taken by oral examination), one individual, noting that the procedure for taking testimony by written questions is unsatisfactory and often frustrating, suggested that the paragraph be changed to require that a party seeking to utilize this procedure (in lieu of an oral examination) file a motion requesting, for good cause shown, permission to by-pass the oral examination of its witness, that is, that the burden of filing a motion and showing good cause be shifted to the party who wants to take testimony upon written questions.

*Response:* If the burden of filing the motion were shifted in the manner suggested, the Trademark Trial and Appeal Board would have to rule on a motion in every case where a party desires to take testimony by written questions. Under the rule as proposed, the Board would have to rule on a motion only in those cases where one party desires to take testimony by written questions and the adverse party objects to the use of this procedure in lieu of an oral depositon. Often, the adverse party does not object. Moreover, Rule 31 F.R.C.P., which provides for the use of depositions upon written questions in federal district courts, does not require that a party who wishes to use this procedure file a motion requesting permission to do so. Accordingly, this suggestion has not been adopted.

*Comment:* Two organizations commented that proposed paragraphs (j) and (k) of §2.123, which relate to the raising of objections to testimony depositions taken in inter partes proceedings, appear to be inconsistent and unclear as to the timing of objections. Both organizations suggested that the paragraphs be modified to rely upon the pertinent portion of the Federal Rules of Civil Procedure, namely, Rule 32(d)(3). Similarly, one individual commented that proposed paragraph (k) is ambiguous as to the timing of an objection to testimony based upon lack of competency of the witness.

*Response:* In order to improve their consistency and clarity, the paragraphs have been modified as suggested. It should be noted that the result of the modification of paragraph (j) is that if a party fails to attend the taking of a deposition, he thereby waives any objection which under Rule 32(d)(3)(A) and (B) F.R.C.P. is deemed to be waived if not made at the taking of the deposition. This is a significant change from existing §2.123(j), which permits the raising of formal or technical objections as soon as a party becomes aware of them, e.g., in the case of a party who did not attend the taking of a deposition, at the time when such party receives a copy of a transcript of the deposition.

*Comment:* With respect to the same paragraphs, one individual suggested that the Trademark Trial and Appeal Board entertain and determine, prior to the briefing period, motions to strike testimony, so that parties to a proceeding before the Board will know exactly what is in the record when they write their briefs.

*Response:* The adoption of this suggestion would put an intolerable burden on the Board because the Board would have to read testimony depositions both at the time of determination of a motion to strike them and again at final hearing. It is the longstanding policy of the Board not to read trial testimony taken in a proceeding before it, or to examine other evidence offered by the parties in support of their respective cases, until final hearing,. See, for example: *Curtice-Burns, Inc.* v. *Northwest Sanitation Products, Inc.*, 182 USPQ 572 (Comr. 1974), and *Clairol Inc.* v. *Holland Hall Products, Inc.*, 161 USPQ 616 (TTAB 1969). Accordingly, the suggestion has not been adopted.

*Comment:* With respect to proposed §2.124(d)(2) (which provides in part that when one or more testimonial depositions are to be taken upon written questions, the Trademark Trial and Appeal Board may suspend or reschedule other proceedings in the matter to allow for the orderly completion of the depositions upon written questions), one individual expressed his belief that when the Board receives notice that a deposition is to be taken upon written questions, it should immediately suspend proceedings for a sixty-day period to allow for the completion of the deposition, thereby avoiding unnecessary motions to extend the trial periods.

*Response:* The paragraph has been modified to provide that in such situations the Board "shall" suspend or reschedule other proceedings in the matter to allow for the orderly completion of the deposition. The length of the suspension has been left to the discretion of the Board since the time required to complete the taking of a deposition upon written questions varies according to the place where the witness is located.

*Comment:* One organization, noting that the words "the letter" in proposed §2.124(e) have no antecedent and hence create an unnecessary ambiguity, suggested that the words "the notice and of all of the questions mailed" be substituted therefor. With respect to the statement in proposed §2.124(f) that it is the responsibility of the party who takes a deposition upon written questions to assure that the transcript is correct, the same organization suggested that the paragraph be modified to include a cross-reference to proposed §2.125(b), which specifies procedures for correcting transcripts.

*Response:* The paragraphs have been modified as suggested.

*Comment:* With respect to proposed §§2.27(e), 2.120(f), and 2.125(e), which relate to the provision, in inter partes proceedings before the Trademark Trial and Appeal Board, of certain types of discovery information, and the submission of certain types of trial evidence, under protective order, one individual commented that the proposed rules would appear to permit parties to keep virtually all relevant information confidential from the public at large.

*Response:* Under the rules as proposed and adopted, only trade secrets and confidential information are held under seal and kept confidential by the Board. Very little of the evidence offered in inter partes proceedings before the Trademark Trial and Appeal Board is of this nature.

*Comment:* Two organizations objected to proposed §2.128(a)(3) (which provides in essence that when a party fails to file a brief on the case, the Trademark Trial and Appeal Board may treat such failure as a concession of the case) on the grounds that the proposed rule is unduly harsh; that it constitutes an abrogation of the Board's responsibility to decide cases on the record before it, regardless of the absence of briefs; that the granting or denial of a registration with its evidentiary presumptions is too important an issue to be decided on the basis of a presumed concession; and that a party who fails to file a brief should at least be given an opportunity to show cause why judgment should not be entered against him for such failure. Similarly, one member of another organization believes that the proposed rule would encourage the filing of spurious oppositions in cases where the opposer feels that the applicant may not be in a position to afford the legal fees required for preparing a brief.

*Response:* For the reasons indicated in the comments, proposed §2.128(a)(3) has been modified to refer only to the party in the position of plaintiff, and proposed §2.128(a)(1) has been modified to make it clear that the filing of a brief on the case is not mandatory for the party in the position of defendant. Further, the primary purpose of proposed §2.128(a)(3) was to save the Board the burden of determining cases of the merits in instances where the parties have settled, but have failed to inform the Board thereof, or where one party, particularly the plaintiff, has lost interest in the case. It is not the intention of the Board to enter judgment against a plaintiff for failure to file a brief on the case if the plaintiff still desires to obtain a determination of the case on the merits. Accordingly, proposed §2.128(a)(3) has been modified herein to provide an opportunity for the plaintiff who fails to file a main brief on the case to show cause why such failure should not be treated as a concession of the case. Additionally, the paragraph has been modified to indicate that judgment may be entered against a plaintiff for failure to file a main brief only if plaintiff fails to file a response to the order to show

cause or files a response indicating that he has lost interest in the case.

*Comment:* One organization, noting that proposed §2.128(b) permits briefs to be filed on legal or letter size paper, suggested that since the federal courts now permit only the use of letter size paper, consideration should be given to requiring that briefs and all other formal papers filed in the Patent and Trademark Office by on letter size paper only. With respect to the same paragraph, one individual recommended, because of the different paper sizes permitted under the rule, that the rule be modified to specify the number of words that a brief can contain or, alternatively, to specify separately the number of pages permitted for briefs written on each size of paper. The same individual suggested that it should be made clear that the permitted number of pages in a brief does not include pages containing the index and the alphabetical list of cases.

*Response:* The paragraph has been modified to require that briefs be submitted on letter size paper. As to what is included within the specified page limitations, the paragraph as proposed and adopted states in part that "no brief shall contain more that fifty pages *of argument* and, in the case of a reply brief, *the entire brief* shall not exceed twenty-five pages" (emphasis added). It is believed that the paragraph as written clearly indicates that the fifty-page limitation for a main brief applies only to the length of the argument and does not include the index and case list pages, but that the twenty-five page limitation for a reply brief applies to the entire brief, e.g., argument, index, case list, and all. Accordingly, no further modification has been made.

*Comment:* With respect to proposed §2.134(b) (which provides that if the respondent in a cancellation proceeding permits his involved registration to be cancelled under section 8 of the Act of 1946 or fails to renew the registration under section 9 of the Act of 1946, such cancellation or failure to renew shall be deemed to be the equivalent of a cancellation by request of respondent without the consent of the adverse party and shall result in entry of judgment against respondent), two organizations commented that the judgment entered against a respondent under the proposed paragraph would have a res judicata effect; that the entry of such a judgment would be unduly harsh where the cancellation or expiration was the result of an inadvertence or mistake; and that, at a minimum, a respondent should be allowed to "show cause" why such a judgment should be entered. Similarly one individual commented that in such situations, a respondent whose use of its registered mark has in fact been discontinued should be put in a position whereby it can terminate the dispute with prejudice only as to the ground of abandonment.

*Response:* The paragraph has been modified to provide an opportunity for the respondent in such situation to "show cause" why judgment should not be entered against it. If respondent submits a showing that the cancellation or expiration was the result of an inadvertence or mistake, judgment will not be entered against it. If respondent submits a showing that the cancellation or expiration was occasioned by the fact that its registered mark had been abondoned and that such abandonment was not made for purposes of avoiding the proceeding but rather was the result, for example, of a two-year period of nonuse which commenced well before respondent learned of the existence of the proceeding, judgment will be entered against it only and specifically on the ground of abandonment.

*Comment:* Apparently with respect to proposed §2.135 (which provides that after the commencement of an opposition proceeding, if applicant files a written abandonment of the application or of the mark without the written consent of every adverse party, judgment shall be entered against the applicant), one individual expressed his belief that if an applicant involved in an opposition were allowed to abandon its mark or application without the consent of the opposer without incurring entry of judgment against itself, more applicants would abandon, thus saving money for the Patent and Trademark Office.

*Response:* The purpose of §2.135 is to prevent an applicant involved in an opposition from abandoning its opposed application and then refiling, thus putting opposer (and the Patent and Trademark Office) to the expense of multiple proceedings. A rule to the contrary would be inequitable. Accordingly, §2.135 has not been modified in the manner suggested by this comment.

*Comment:* One individual questioned the necessity for the requirement in proposed §2.142(e)(2) that if the appellant in an ex parte proceeding requests an oral argument, the examiner who issued a refusal of registration or a requirement from which an appeal is taken, or in lieu thereof another examiner from the same examining division as designated by the supervisory attorney thereof, shall present an oral argument.

*Response:* The purpose of the requirement is to ensure that the examining attorney will be present at the oral hearing to respond to any new arguments raised by appellant and to answer any questions which the members of the panel assigned to hear the case may have. The examining attorney's oral argument need not be lengthy; if he (she) has nothing to add to what he (she) has already said in his (her) appeal brief, he (she) may simply say so.

*Comment:* With respect to the last sentence of proposed §2.165(a) (which states in essence that the certificate of mailing procedure provided by §1.8 does not apply to affidavits or declarations filed under section 8 (a) or (b) of the Act), one organization expressed its belief that the sentence should be deleted in light of H.R. 6260.

*Response:* H.R. 6260, which was enacted on Aug. 27, 1982 as Pub. L.97-247, amended 35 U.S.C. 21 to include a provision that the Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner. As a result thereof, a new section, §1.10, effective Feb. 27, 1983, has been added, by final rule notice published in the **Federal Register** on Jan. 20, 1983 at 48 FR 2696, to Part I of Title 37 CFR. The new section provides a procedure for assigning the date on which any paper or fee is deposited as "Express Mail" with the United States Postal Service as the filing date of the paper or fee in the Patent and Trademark Office. Inasmuch as this new section applies to "any paper or fee", it applies to affidavits or declarations filed under section 8 (a) or (b) of the Act of 1946. However, the §1.8 certificate of mailing procedure has not been eliminated, and that section still specifically provides that the procedure outlined therein does not apply to affidavits filed under section 8 (a) or (b) of the Act. In view thereof, the last sentence of §2.165(a) has been amended by the addition of a final clause, namely, "but the certificate of mailing by 'Express Mail' procedure provided by §1.10 does apply thereto."

*Comment:* One organization has submitted suggestions for changes to rules not involved herein.

*Response:* The suggested changes cannot be adopted without affording members of the public an opportunity to comment thereon. However, these suggestions will be considered in connection with any future proposals to amend the rules in question.

Environmental, energy and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. '96-354). The rule change includes no additional or increased fees. Substantive rights to use valuable trademarks are not adversely affected.

The rule change does not impose a record keeping or reporting burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. No additional informa-

tion is required from the public. No additional records are required to be maintained by the Patent and Trademark Office because there are no additional fees or proceedings to monitor.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant, adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign based enterprises in domestic or export markets.

**List of Subjects in 37 CFR Part 2**

Administrative practice and procedures, Courts, Lawyers, Trademarks

*Amendments of Regulations*

After consideration of the comments received and pursuant to the authority contained in 15 U.S.C. 1123, Part 2 of Title 37 of the Code of Federal Regulations is amended as set forth below.

**PART 2–RULES OF PRACTICE IN TRADEMARK CASES**

1. Section 2.27 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

**§2.27 Pending trademark application index; access to applications.**

* * * * *

(b) Except as provided in paragraph (e) of this section, access to the file of a particular pending application will be permitted prior to publication under §2.60 upon written request.

* * * * *

(d) Except as provided in paragraph (e) of this section, after a mark has been registered, or published for opposition, the file of the application and all proceedings relating thereto are available for public inspection and copies of the papers may be furnished upon paying the fee therefor.

(e) Anything ordered to be filed under seal pursuant to a protective order issued or made by any court or by the Trademark Trial and Appeal Board in any proceeding involving an application or a registration shall be kept confidential and shall not be made available for public inspection or copying unless otherwise ordered by the court or the Board, or unless the party protected by the order voluntarily discloses the matter subject thereto. When possible, only confidential portions of filing with the Board shall be filed under seal.

2. Section 2.63 is revised to read as follows:

**§2.63 Reexamination.**

(a) After response by the applicant, the application will be reexamined or reconsidered. If registration is again refused or any formal requirement(s) is repeated, but the examiner's action is not stated to be final, the applicant may respond again.

(b) After reexamination the applicant may respond by filing a timely petition to the Commissioner for relief from a formal requirement if: (1) The requirement is repeated, but the examiner's action is not made final, and the subject matter of the requirement is appropriate for petition to the Commissioner (see §2.146(b)); or (2) the examiner's action is made final and such action is limited to subject matter appropriate for petition to the Commissioner. If the petition is denied, the applicant shall have until six months from the date of the Office action which repeated the requirement or made it final or thirty days from the date of the decision on the petition, whichever date is later, to comply with the requirement. A formal requirement which is the subject of a petition decided by the Commissioner may not subsequently be the subject of an appeal to the Trademark Trial and Appeal Board.

3. Section 2.64 is revised to read as follows:

**§2.64 Final Action.**

(a) On the first or any subsequent reexamination or reconsideration the refusal of the registration or the insistence upon a requirement may be stated to be final, whereupon applicant's response is limited to an appeal, or to a compliance with any requirement, or to a petition to the Commissioner if permitted by §2.63(b).

(b) During the period between a final action and expiration of the time for filing an appeal, the applicant may request the examiner to reconsider the final action. The filing of a request for reconsideration will not extend the time for filing an appeal or petitioning the Commissioner, but normally the examiner will reply to a request for reconsideration before the end of the six-month period if the request is filed within three months after the date of the final action. Amendments accompanying requests for reconsideration after final action will be entered if they comply with the rules of practice in trademark cases and the Act of 1946.

4. Section 2.65 is revised to read as follows:

**§2.65 Abandonment.**

(a) If an applicant fails to respond, or to respond completely, within six months after the date an action is mailed, the application shall be deemed to have been abandoned. A timely petition to the Commissioner pursuant to §§2.63(b) and 2.146 is a response which avoids abandonment of an application.

(b) When action by the applicant filed within the six-month response period is a bona fide attempt to advance the examination of the application and is substantially a complete response to the examiner's action, but consideration of some matter or compliance with some requirement has been inadvertently omitted, opportunity to explain and supply the omission may be given before the question of abandonment is considered.

5. Section 2.72 is revised to read as follows:

**§2.72 Amendments to description or drawing of the mark.**

Amendments to the description or drawing of the mark may be permitted only if warranted by the specimens (or facsimilies) as originally filed, or supported by additional specimens (or facsimilies) and a supplemental affidavit or declaration in accordance with §2.20 alleging that the mark shown in the amended drawing was in actual use prior to the filing date of the application. Amendments may not be made if the character of the mark is materially altered.

6. Section 2.81 is revised to read as follows:

**§2.81 Allowance of application.**

If no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared and no concurrent use proceeding is instituted, the application will be prepared for issuance of the certificate of registration as provided in §2.151.

**§2.88 [Removed]**

7. Section 2.88 is removed.

**§2.94 [Removed]**

8. Section 2.94 is removed.

**§2.95 [Removed]**

9. Section 2.95 is removed.

10. Section 2.96 is revised to read as follows:

**§2.96 Issue; burden of proof.**

The issue in an interference between applications is normally priority of use, but the rights of the parties to registration may also be determined. The party whose application involved in the interference has the latest filing date is the junior party and has the burden of proof. When there are more than two parties to an interference, a party shall be a junior to and shall have the bur-

den of proof as against every other party whose application involved in the interference has an earlier filing date. If the involved applications of any parties have the same filing date, the application with the latest date of execution will be deemed to have the latest filing date and that applicant will be the junior party. The issue in an interference between an application and a registration shall be the same, but in the event the final decision is adverse to the registrant, a registration to the applicant will not be authorized so long as the interfering registration remains on the register.

**§2.97 [Removed]**

11. Section 2.97 is removed.

12. Section 2.98 is revised to read as follows:

**§2.98 Adding party to interference.**

A party may be added to an interference only upon petition to the Commissioner by that party. If an application which is or might be the subject of a petition for addition to an interference is not added, the examiner may suspend action on the application pending termination of the interference proceeding.

13. Section 2.99 is revised to read as follows:

**§2.99 Application to register as concurrent user.**

(a) An application for registration as a lawful concurrent user will be examined in the same manner as other applications for registration.

(b) When it is determined that the mark is ready for publication, the applicant may be required to furnish as many copies of this application, specimens and drawing as may be necessary for the preparation of notices for each applicant, registrant or user specified as a concurrent user in the application for registration.

(c) Upon receipt of the copies required by paragraph (b) of this section, the examiner shall forward the application for concurrent use registration for publication in the Official Gazette as provided by §2.80. If no opposition is filed, or if all oppositions that are filed are dismissed or withdrawn, the Trademark Trial and Appeal Board shall prepare a notice for the applicant for concurrent use registration and for each applicant, registrant or user specified as a concurrent user in the application. The notices for the specified parties shall state the name and address of the applicant and of the applicant's attorney or other authorized representative, if any, together with the serial number and filing date of the application.

(d)(1) The notices shall be sent to each applicant, in care of his attorney or other authorized representative, if any, to each user, and to each registrant. A copy of the application shall be forwarded with the notice to each party specified in the application.

(2) An answer to the notice is not required in the case of an applicant or registrant whose application or registration is specified as a concurrent user in the application, but a statement, if desired, may be filed within forty days after the mailing of the notice; in the case of any other party specified as a concurrent user in the application, and answer must be filed within forty days after the mailing of the notice.

(3) If an answer, when required, is not filed, judgment will be entered precluding the specified user from claiming any right more extensive than that acknowledged in the application(s) for concurrent use registration, but the applicant(s) will remain with the burden of proving entitlement to registration(s).

(e) The applicant for a concurrent use registration has the burden of proving entitlement thereto. If there are two or more applications for concurrent use registration involved in a proceeding, the party whose application has the latest filing date is the junior party. A party whose application has a filing date between the filing dates of the earliest involved application and the latest involved application is a junior party to every party whose involved application has an earlier filing date. If any applications have the same filing date, the application with the latest date of execution will be deemed to have the latest filing date and that applicant will be the junior party. A person specified as an excepted user in a concurrent use application but who has not filed an application shall be considered a party senior to every party that has an application involved in the proceeding.

(f) When a concurrent use registration is sought on the basis that a court of competent jurisdiction has finally determined that the parties are entitled to use the same or similar marks in commerce, a concurrent use registration proceeding will not be instituted if all of the following conditions are fulfilled:

(1) The applicant is entitled to registration subject only to the concurrent lawful use of a party to the court proceeding; and

(2) The court decree specifies the rights of the parties; and

(3) A true copy of the court decree is submitted to the examiner; and

(4) The concurrent use application complies fully and exactly with the court decree; and

(5) The excepted use specified in the concurrent use application does not involve a registration, or any involved registration has been restricted by the Commissioner in accordance with the court decree.

If any of the conditions specified in this paragraph is not satisfied, a concurrent use registration proceeding shall be prepared and instituted as provided in paragraphs (a) throught (e) of this section.

(g) Registrations and applications to register on the Supplemental Register and registrations under the Act of 1920 are not subject to concurrent use registration proceedings.

14. Section 2.104 is revised to read as follows:

**§2.104 Contents of opposition.**

The opposition must set forth a short and plain statement showing how the opposer would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition, including exhibits, shall be filed with the opposition.

15. Section 2.105 is revised to read as follows:

**§2.105 Notification of opposition proceeding(s).**

When an opposition in proper form has been filed and the correct fee(s) have been submitted, a notification shall be prepared by the Trademark Trial and Appeal Board, which shall identify the title and number of the proceeding and the application involved and shall designate a time, not less than thirty days from the mailing date of the notification, within which an answer must be filed. A copy of the notification shall be forwarded to the attorney or other authorized representative of the opposer, if any, or to the opposer. The duplicate copy of the opposition and exhibits shall be forwarded with a copy of the notification to the attorney or other authorized representative of the applicant, if any, or to the applicant.

16. Section 2.106 is amended by revising paragraph (c) to read as follows:

**§2.106 Answer.**

* * * * *

(c) The opposition may be withdrawn without prejudice before the answer is filed. After the answer is filed, the opposition may not be withdrawn without prejudice except with the written consent of the applicant.

17. Section 2.107 is revised to read as follows:

**§2.107 Amendment of pleadings in an opposition proceeding.**

Pleadings in an opposition proceeding may be amended in the same manner and to the same extent as

in a civil action in a United States district court.

18. Section 2.113 is revised to read as follows:

**§2.113 Notification of cancellation proceeding.**

(a) When a petition for cancellation has been filed in proper form (see §§2.111 and 2.112), a notification shall be prepared by the Trademark Trial and Appeal Board, which shall identify the title and number of the proceeding and the registration or registrations involved and shall designate a time, not less than thirty days from the mailing date of the notification, within which an answer must be filed. A copy of the notification shall be forwarded to the attorney or other authorized representative of the petitioner, if any, or to the petitioner. The duplicate copy of the petition for cancellation and exhibits shall be forwarded with a copy of the notification to the respondent (see §2.118). If the petition is found to be defective as to form, the party filing the petition shall be so advised and allowed a reasonable time for correcting the informality.

19. Section 2.115 is revised to read as follows:

**§2.115 Amendment of pleadings in a cancellation proceeding.**

Pleadings in a cancellation proceeding may be amended in the same manner and to the same extent as in a civil action in a United States district court.

20. Section 2.116 is amended by revising paragraphs (b) and (c) to read as follows:

**§2.116 Rules of Procedure.**

* * * * *

(b) The opposer in an opposition proceeding or the petitioner in a cancellation proceeding shall be in the position of plaintiff, and the applicant in an opposition proceeding or the respondent in a cancellation proceeding shall be in the position of defendant. A party that is a junior party in an interference proceeding or in a concurrent use registration proceeding shall be in the position of plaintiff against every party that is senior, and the party that is a senior party in an interference proceeding or in a concurrent use registration proceeding shall be defendant against every party that is junior.

(c) The opposition or the petition for cancellation and the answer correspond to the complaint and answer in a court proceeding.

21. Section 2.117 is revised to read as follows:

**§2.117 Suspension of proceedings.**

(a) Whenever it shall come to the attention of the Trademark Trial and Appeal Board that parties to a pending case are engaged in a civil action which may be dispositive of the case, proceedings before the Board may be suspended until termination of the civil action.

(b) Whenever there is pending, at the time when the question of the suspension of proceedings is raised, a motion which is potentially dispositive of the case, the motion may be decided before the question of suspension is considered.

(c) Proceedings may also be suspended, for good cause, upon motion or a stipulation of the parties approved by the Board.

22. Section 2.120 is revised to read as follows:

**§2.120 Discovery.**

(a) *In general.* The provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference and concurrent use registration proceedings except as otherwise provided in this section. The Trademark Trial and Appeal Board will specify the closing date for the taking of discovery.

(b) *Discovery deposition within the United States.* The deposition of a natural person shall be taken in the Federal judicial district where the person resides or is regularly employed or at any place on which the parties agree by stipulation. The responsibility rests wholly with the party taking discovery to secure the attendance of a proposed deponent other than a party or anyone who, at the time set for the taking of the deposition, is an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or Rule 31(a) of the Federal Rules of Civil Procedure. See 35 U.S.C. 24.

(c) *Discovery deposition in foreign countries.* (1) The discovery deposition of a natural person residing in a foreign country who is a party or who, at the time set for the taking of the deposition, is an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or Rule 31(a) of the Federal Rules of Civil Procedure, shall, if taken in a foreign country, be taken in the manner prescribed by §2.124 unless the Trademark Trial and Appeal Board, upon motion for good cause, orders or the parties stipulate, that the deposition be taken by oral examination.

(2) Whenever a foreign party is or will be, during a time set for discovery, present within the United States or any territory which is under the control and jurisdiction of the United States, such party may be deposed by oral examination upon notice by the party seeking discovery. Whenever a foreign party has or will have, during a time set for discovery, an officer, director, managing agent, or other person who consents to testify on its behalf, present within the United States or any territory which is under the control and jurisdiction of the United States, such officer, director, managing agent, or other person who consents to testify in its behalf may be deposed by oral examination upon notice by the party seeking discovery. The party seeking discovery may have one or more officers, directors, managing agents, or other persons who consent to testify on behalf of the adverse party, designated under Rule 30(b)(6) of the Federal Rules of Civil Procedure. The deposition of a person under this paragraph shall be taken in the Federal judicial district where the witness resides or is regularly employed, or, if the witness neither resides nor is regularly employed in a Federal judicial district, where the witness is at the time of the deposition. This paragraph does not preclude the taking of a discovery deposition of a foreign party by any other procedure provided by paragraph (c)(1) of this section.

(d) *Request for production.* The production of documents and things under the provisions of Rule 34 of the Federal Rules of Civil Procedure will be made at the place where the documents and things are usually kept, or where the parties agree, or where and in the manner which the Trademark Trial and Appeal Board, upon motion, orders.

(e) *Motion for an order to compel discovery.* If a party fails to designate a person pursuant to Rule 30(b)(6) or Rule 31(a) of the Federal Rules of Civil Procedure, or if a party, or such designated person, or an officer, director or managing agent of a party fails to attend a deposition or fails to answer any question propounded in a discovery deposition, or any interrogatory, or fails to produce and permit the inspection and copying of any document or thing, the party seeking discovery may file a motion before the Trademark Trial and Appeal Board for an order to compel a designation, or attendance at a deposition, or an answer, or production and an opportunity to inspect and copy. The motion shall include a copy of the request for designation or of the relevant portion of the discovery deposition; or a copy of the interrogatory with any answer or objection that was made; or a copy of the request for production, any proffer of production or objection to production in response to the request, and a list and brief description of the documents or things that were not produced for inspection and copying. The motion must be supported by a written statement from the moving party that such party or the attorney therefor has made a good faith effort, by conference or correspondence, to resolve with the other party or the attorney therefor the issues presented in the motion and has been unable to reach agreement. If issues raised in the motion are subsequently resolved by agreement of the parties, the moving party should inform the

Board in writing of the issues in the motion which no longer require adjudication.

(f) *Motion for a protective order.* Upon motion by a party from whom discovery is sought, and for good cause, the Trademark Trial and Appeal Board may make any order which justice requires to protect a party from annoyance, embarrassment, oppression, or undue burden or expense, including one or more of the types of orders provided by clauses (1) through (8), inclusive, of Rule 26(c) of the Federal Rules of Civil Procedure. If the motion for a protective order is denied in whole or in part, the Board may, on such conditions (other than an award of expenses to the party prevailing on the motion) as are just, order that any party provide or permit discovery.

(g) *Failure to comply with order.* If a party fails to comply with an order of the Trademark Trial and Appeal Board relating to discovery, including a protective order, the Board may make any appropriate order, including any of the orders provided in Rule 37(b)(2) of the Federal Rules of Civil Procedure, except that the Board does not have authority to hold any person in contempt or to award any expenses to any party. The Board may impose against a party any of the sanctions provided by this subsection in the event that said party or any attorney, agent, or designated witness of that party fails to comply with a protective order made pursuant to Rule 26(c) of the Federal Rules of Civil Procedure.

(h) *Request for admissions.* Requests for admissions shall be governed by Rule 36 of the Federal Rules of Civil Procedure except that the Trademark Trial and Appeal Board does not have authority to award any expenses to any party. A motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission shall include a copy of the request for admission and any exhibits thereto and of the answer or objection. The motion must be supported by a written statement from the moving party that such party or the attorney therefor has made a good faith effort, by conference or correspondence, to resolve with the other party or the attorney therefor the issues presented in the motion and has been unable to reach agreement. If issues raised in the motion are subsequently resolved by agreement of the parties, the moving party should inform the Board in writing of the issues in the motion which no longer require adjudication.

(i) *Telephone and pre-trial conferences.* (1) Whenever it appears to the Trademark Trial and Appeal Board that a motion filed in an inter partes proceeding is of such nature that its resolution by correspondence is not practical, the Board may, upon its own initiative or upon request made by one or both of the parties, resolve the motion by telephone conference.

(2) Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of an inter partes proceeding have become so complex that their resolution by correspondence or telephone conference is not practical and that resolution would be likely to be facilitated by a conference in person of the parties or their attorneys with a Member or Attorney-Examiner of the Board, the Board may, upon its own initiative or upon motion made by one or both of the parties, request that the parties or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices for a pre-trial conference.

(j) *Use of discovery deposition, admission, or answer to interrogatory.* (1) The discovery deposition of a party or of anyone who at the time of taking the deposition was on officer, director or managing agent of a party, or a person designated by a party pursuant to Rule 30(b)(6) or Rule 31(a) of the Federal Rules of Civil Procedure, may be offered in evidence by an adverse party.

(2) Except as provided in paragraph (j)(1) of this section, the discovery deposition of a witness, whether or not a party, shall not be offered in evidence unless the person whose deposition was taken is, during the testimony period of the party offering the deposition, dead; or out of the United States (unless it appears that the absence of the witness was procured by the party offering the deposition); or unable to testify because of age, illness, infirmity, or imprisonment; or cannot be served with a subpoena to compel attendance at a testimonial deposition; or there is a stipulation by the parties; or upon a showing that such exceptional circumstances exist as to make it desirable, in the interest of justice, to allow the deposition to be used. The use of a discovery deposition by any party under this paragraph will be allowed only by stipulation of the parties approved by the Trademark Trial and Appeal Board, or by order of the Board on motion, which shall be filed at the time of the purported offer of the deposition in evidence, unless the motion is based upon a claim that such exceptional circumstances exist as to make it desirable, in the interest of justice, to allow the deposition to be used, in which case the motion shall be filed promptly after the circumstances claimed to justify use of the deposition became known.

(3) A discovery deposition, an answer to an interrogatory, or an admission to a request for admission, which may be offered in evidence under the provisions of paragraph (j) of this section may be made of record in the case by filing the deposition or any part thereof with any exhibit to the part that is filed, or a copy of the interrogatory and answer thereto with any exhibit made part of the answer, or a copy of the request for admission and any exhibit thereto and the admission (or a statement that the party from whom an admission was requested failed to respond thereto), together with a notice of reliance. The notice of reliance and the material submitted thereunder should be filed during the testimony period of the party who files the notice of reliance. An objection made at a discovery deposition by a party answering a question subject to the objection will be considered at final hearing.

(4) If only part of a discovery deposition is submitted and made part of the record by a party, an adverse party may introduce under a notice of reliance any other part of the deposition which should in fairness be considered so as to make not misleading what was offered by the submitting party.

(5) An answer to an interrogatory, or an admission to a request for admission, may be submitted and made part of the record by only the inquiring party except that, if fewer than all of the answers to interrogatories, or fewer than all of the admissions, are offered in evidence by the inquiring party, the responding party may introduce under a notice of reliance any other answers to interrogatories, or any other admissions, which should in fairness be considered so as to make not misleading what was offered by the inquiring party.

(6) Paragraph (j) of this section will not be interpreted to preclude the reading or the use of a discovery deposition, or answer to an interrogatory, or admission as part of the examination or cross-examination of any witness during the testimony period of any party.

(7) When a discovery deposition, or a part thereof, or an answer to an interrogatory, or an admission, has been made of record by one party in accordance with the provisions of paragraph (j)(3) of this section, it may be referred to by any party for purpose permitted by the Federal Rules of Evidence.

(8) Interrogatories, requests for production, requests for admissions, and materials or depositions obtained during the discovery period should not be filed with the Board except when submitted with a motion to compel discovery, or in support of or response to a motion for summary judgment, or under a notice of reliance during a party's testimony period.

23. Section 2.121 is revised to read as follow:

**§2.121 Assignment of times for taking testimony.**

(a)(1) The Trademark Trial and Appeal Board will issue a trial order assigning to each party the time for taking testimony. No testimony shall be taken except during the times assigned, unless by stipulation of the

parties approved by the Board, or, upon motion, by order of the Board. Testimony periods may be rescheduled by stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board. The resetting of the closing date for discovery will result in the rescheduling of the testimony periods without action by any party.

(2) The initial trial order will be mailed by the Board after issue is joined.

(b)(1) The Trademark Trial and Appeal Board will schedule a testimony period for the plaintiff to present its case in chief, a testimony period for the defendant to present its case and to meet the case of the plaintiff, and a testimony period for the plaintiff to present evidence in rebuttal.

(2) When there is a counterclaim, or when proceedings have been consolidated and one party is in the position of plaintiff in one of the involved proceedings and in the position of defendant in another of the involved proceedings, or when there is an interference or a concurrent use registration proceeding involving more than two parties, the Board will schedule testimony periods so that each party in the position of plaintiff will have a period for presenting its case in chief against each party in the position of defendant, each party in the position of defendant will have a period for presenting its case and meeting the case of each plaintiff, and each party in the position of plaintiff will have a period for presenting evidence in rebuttal.

(c) A testimony period which is solely for rebuttal will be set for fifteen days. All other testimony periods will be set for thirty days. The periods may be extended by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion granted by the Board, or by order of the Board.

(d) When parties stipulate to the rescheduling of testimony periods or to the rescheduling of the closing date for discovery and the rescheduling of testimony periods, a stipulation presented in the form used in a trial order, signed by the parties, or a motion in said form signed by one party and including a statement that every other party has agreed thereto, and submitted in one original plus as many photocopies as there are parties, will, if approved, be so stamped, signed, and dated, and the copies will be promptly returned to the parties.

24. Section 2.122 is revised to read as follows:

**§2.122 Matters in evidence.**

(a) *Rules of evidence.* The rules of evidence for proceedings before the Trademark Trial and Appeal Board are the Federal Rules of Evidence, the relevant provisions of the Federal Rules of Civil Procedure, the relevant provisions of Title 28 of the United States Code, and the provisions of this Part of Title 37 of the Code of Federal Regulations.

(b) *Application files.* (1) The file of each application or registration specified in a declaration of interference, of each application or registration specified in the notice of a concurrent use registration proceeding, of the application against which a notice of opposition is filed, or of each registration against which a petition or counterclaim for cancellation is filed forms part of the record of the proceeding without any action by the parties and reference may be made to the file for any relevant and competent purpose.

(2) The allegation in an application for registration, or in a registration, of a date of use is not evidence on behalf of the applicant or registrant; a date of use of a mark must be established by competent evidence. Specimens in the file of an application for registration, or in the file of a registration, are not evidence on behalf of the applicant or registrant unless identified and introduced in evidence as exhibits during the period for the taking of testimony.

(c) *Exhibits to pleadings.* Except as provided in paragraph (d)(1) of this section, an exhibit attached to a pleading is not evidence on behalf of the party to whose pleading the exhibit is attached unless identified and introduced in evidence as an exhibit during the period for the taking of testimony.

(d) *Registrations.* (1) A registration of the opposer or petitioner pleaded in an opposition or petition to cancel will be received in evidence and made part of the record if the opposition or petition is accompanied by two copies of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration. For the cost of a copy of a registration showing status and title, see §2.6(n).

(2) A registration owned by any party to a proceeding may be made of record in the proceeding by that party by appropriate identification and introduction during the taking of testimony or by filing a notice of reliance, which shall be accompanied by a copy of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration. The notice of reliance shall be filed during the testimony period of the party that files the notice.

(e) *Printed publications and official records.* Printed publications, such as books and periodicals, available to the general public in libraries or of general circulation among members of the public or that segment of the public which is relevant under an issue in a proceeding, and official records, if the publication or official record is competent evidence and relevant to an issue, may be introduced in evidence by filing a notice of reliance on the material being offered, which notice shall specify the printed publication or the official record and the pages to be read, indicate generally the relevance of the material being offered, and be accompanied by the official record or a copy thereof whose authenticity is established under the Federal Rules of Evidence, or by the printed publication or a copy of the relevant portion thereof, including the title page and any other page needed to show the place and date of publication, the name and address of the publisher, and the name of the author or the editor. A copy of an official record of the Patent and Trademark Office need not be certified to be offered in evidence. The notice of reliance shall be filed during the testimony period of the party that files the notice.

(f) *Testimony from other proceedings.* By order of the Trademark Trial and Appeal Board, on motion, testimony taken in another proceeding, or testimony taken in a suit or action in a court, between the same parties or those in privity may be used in a proceeding, so far as relevant and material, subject, however, to the right of any adverse party to recall or demand the recall for examination or cross-examination of any witness whose prior testimony has been offered and to rebut the testimony.

25. Section 2.123 is amended by revising paragraphs (a), (e)(3), (j) and (k) to read as follows:

**§2.123 Trial testimony in inter partes cases.**

(a)(1) The testimony of witnesses in inter partes cases may be taken by depositions upon oral examination as provided by this section or by depositions upon written questions as provided by §2.124. If a party serves notice of the taking of a testimonial deposition upon written questions of a witness who is, or will be at the time of the deposition, present within the United States or any territory which is under the control and jurisdiction of the United States, any adverse party may, within fifteen days from the date of service of the notice, file a motion with the Trademark Trial and Appeal Board, for good cause, for an order that the deposition be taken by oral examination.

(2) A testimonial deposition taken in a foreign country shall be taken by deposition upon written questions as provided by §2.124, unless the Board, upon motion for good cause, orders that the deposition be taken by oral examination, or the parties so stipulate.

* * * * *

(e) *Examination of witnesses.* * * *

(3) Every adverse party shall have full opportunity to cross-examine each witness. If the notice of examination of witnesses which is served pursuant to paragraph (c) of this section is improper or inadequate with respect to any witness, an adverse party may cross-examine that witness under protest while reserving the right to object to the receipt of the testimony in evidence. Promptly after the testimony is completed, the adverse party, if he wishes to preserve the objection, shall move to strike the testimony from the record, which motion will be decided on the basis of all of the relevant circumstances. A motion to strike the testimony of a witness for lack of proper or adequate notice of examination must request the exclusion of the entire testimony of that witness and not only a part of that testimony.

* * * * *

(j) *Effect of errors and irregularities in depositions:* Rule 32(d) (1), (2), and (3) (A) and (B) of the Federal Rules of Civil Procedure shall apply to errors and irregularities in depositions. Notice will not be taken of merely formal or technical objections which shall not appear to have wrought a substantial injury to the party raising them; and in case of such injury it must be made to appear that the objection was raised at the time specified in said rule.

(k) *Objections to admissibility.* Subject to the provisions of paragraph (j) of this section, objection may be made to receiving in evidence any deposition, or part thereof, or any other evidence, for any reason which would require the exclusion of the evidence from consideration. Objections to the competency of a witness or to the competency, relevancy, or materiality of testimony must be raised at the time specified in Rule 32(d)(3)(A) of the Federal Rules of Civil Procedure. Such objections will not be considered until final hearing.

26. Section 2.124 is revised to read as follows:

**§2.124 Depositions upon written questions.**

(a) A deposition upon written questions may be taken before any person before whom depositions may be taken as provided by Rule 28 of the Federal Rules of Civil Procedure.

(b)(1) A party desiring to take a testimonial deposition upon written questions shall serve notice thereof upon each adverse party within ten days from the opening date of the testimony period of the party who serves the notice. The notice shall state the name and address of the witness. A copy of the notice, but not copies of the questions, shall be filed with the Trademark Trial and Appeal Board.

(2) A party desiring to take a discovery deposition upon written questions shall serve notice thereof upon each adverse party and shall file a copy of the notice, but not copies of the questions, with the Board. The notice shall state the name and address, if known, of the person whose deposition is to be taken. If the name of the person is not known, a general description sufficient to identify him or the particular class or group to which he belongs shall be stated in the notice, and the party from whom the discovery deposition is to be taken shall designate one or more persons to be deposed in the same manner as is provided by Rule 30(b)(6) of the Federal Rules of Civil Procedure.

(c) Every notice given under the provisions of paragraph (b) of this section shall be accompanied by the name or descriptive title of the officer before whom the deposition is to be taken.

(d)(1) Every notice served on any adverse party under the provisions of paragraph (b) of this section shall be accompanied by the written questions to be propounded on behalf of the party who proposes to take the deposition. Within twenty days from the date of service of the notice, any adverse party may serve cross questions upon the party who proposes to take the deposition; any party who serves cross questions shall also serve every other adverse party. Within ten days from the date of service of the cross questions, the party who proposes to take the deposition may serve redirect questions on every adverse party. Within ten days from the date of service of the redirect questions, any party who served cross questions may serve recross questions upon the party who proposes to take the deposition; any party who serves recross questions shall also serve every other adverse party. Written objections to questions may be served on a party propounding questions; any party who objects shall serve a copy of the objections on every other adverse party. In response to objections, substitute questions may be served on the objecting party within ten days of the date of service of the objections; substitute questions shall be served on every other adverse party.

(2) Upon motion for good cause by any party, or upon its own initiative, the Trademark Trial and Appeal Board may extend any of the time periods provided by paragraph (d)(1) of this section. Upon receipt of written notice that one or more testimonial depositions are to be taken upon written questions, the Trademark Trial and Appeal Board shall suspend or reschedule other proceedings in the matter to allow for the orderly completion of the depositions upon written questions.

(e) Within ten days after the last date when questions, objections, or substitute questions may be served, the party who proposes to take the deposition shall mail a copy of the notice and copies of all the questions to the officer designated in the notice; a copy of the notice and of all the questions mailed to the officer shall be served on every adverse party. The officer designated in the notice shall take the testimony of the witness in response to the questions and shall record each answer immediately after the corresponding question. The officer shall then certify the transcript and mail the transcript and exhibits to the party who took the deposition.

(f) The party who took the deposition shall promptly serve a copy of the transcript, copies of documentary exhibits, and duplicates or photographs of physical exhibits on every adverse party. It is the responsibility of the party who takes the deposition to assure that the transcript is correct (see §2.125(b)). If the deposition is a discovery deposition, it may be made of record as provided by §2.120(j). If the deposition is a testimonial deposition, the original, together with copies of documentary exhibits and duplicates or photographs of physical exhibits, shall be filed promptly with the Trademark Trial and Appeal Board.

(g) Objections to questions and answers in depositions upon written questions may be considered at final hearing.

27. Section 2.125 is revised to read as follows:

**§2.125 Filing and service of testimony.**

(a) One copy of the transcript of testimony taken in accordance with §2.123, together with copies of documentary exhibits and duplicates or photographs of physical exhibits, shall be served on each adverse party within thirty days after completion of the taking of that testimony.

(b) The party who takes testimony is responsible for having all typographical errors in the transcript and all errors of arrangement, indexing and form of the transcript corrected, on notice to each adverse party, prior to the filing of one certified transcript with the Trademark Trial and Appeal Board. The party who takes testimony is responsible for serving on each adverse party one copy of the corrected transcript or, if reasonably feasible, corrected pages to be inserted into the transcript previously served.

(c) One certified transcript and exhibits shall be filed promptly with the Trademark Trial and Appeal Board. Notice of such filing shall be served on each adverse party and a copy of each notice shall be filed with the Board.

(d) Each transcript shall comply with §2.123(g) with respect to arrangement, indexing and form.

(e) Upon motion by any party, for good cause, the Trademark Trial and Appeal Board may order that any part of a deposition transcript or any exhibits that directly disclose any trade secret or other confidential research, development, or commercial information may be filed under seal and kept confidential under the provisions of §2.27(e). If any party or any attorney or agent of a party fails to comply with an order made under this paragraph, the Board may impose any of the sanctions authorized by §2.120(g).

**§2.126 [Removed]**

28. Section 2.126 is removed.

29. Section 2.127 is revised to read as follows:

**§2.127 Motions**

(a) Every motion shall be made in writing, shall contain a full statement of the grounds, and shall embody or be accompanied by a brief. A brief in response to a motion shall be filed within fifteen days from the date of service of the motion unless another time is specified by the Trademark Trial and Appeal Board or the time is extended by order of the Board on motion for good cause. When a party fails to file a brief in response to a motion, the Board may treat the motion as conceded. An oral hearing will not be held on a motion except on order by the Board.

(b) Any request for reconsideration or modification of an order or decision issued on a motion must be filed within thirty days from the date thereof. A brief in response must be filed within fifteen days from the date of service of the request.

(c) Interlocutory motions, requests, and other matters not actually or potentially dispositive of a proceeding may be acted upon by a single Member of the Trademark Trial and Appeal Board or by an Attorney-Examiner of the Board to whom authority so to act has been delegated.

(d) When any party files a motion to dismiss, or a motion for judgment on the pleadings, or a motion for summary judgment, or any other motion which is potentially dispositive of a proceeding, the case will be suspended by the Trademark Trial and Appeal Board with respect to all matters not germane to the motion and no party should file any paper which is not germane to the motion. If the case is not disposed of as a result of the motion, proceedings will be resumed pursuant to an order of the Board when the motion is decided.

30. Section 2.128 is revised to read as follows:

**§2.128 Briefs at final hearing.**

(a)(1) The brief of the party in the position of plaintiff shall be due not later than sixty days after the date set for the close of rebuttal testimony. The brief of the party in the position of defendant, if filed, shall be not later than thirty days after the due date of the first brief. A reply brief by the party in the position of plaintiff, if filed, shall be due not later than fifteen days after the due date of the defendant's brief.

(2) When there is a counterclaim, or when proceedings have been consolidated and one party is in the position of plaintiff in one of the involved proceedings and in the position of defendant in another of the involved proceedings, or when there is an interference or a concurrent use registration proceeding involving more than two parties, the Trademark Trial and Appeal Board will set the due dates for the filing of the main brief, and the answering brief, and the rebuttal brief by the parties.

(3) When a party in the position of plaintiff fails to file a main brief, an order may be issued allowing plaintiff until a set time, not less than fifteen days, in which to show cause why the Board should not treat such failure as a concession of the case. If plaintiff fails to file a response to the order, or files a response indicating that he has lost interest in the case, judgment may be entered against plaintiff.

(b) Briefs shall be submitted in typewritten or printed form, double spaced, on letter size paper. Without leave of the Trademark Trial and Appeal Board, no brief shall contain more than fifty pages of argument and, in the case of a reply brief, the entire brief shall not exceed twenty-five pages. Each brief shall contain an alphabetical index of cases cited therein. One original and two legible copies, on good quality paper, of each brief shall be filed.

31. Section 2.129 is revised to read as follows:

**§2.129 Oral argument; reconsideration.**

(a) If a party desires to have an oral argument at final hearing, the party shall request such argument by a separate notice filed not later than ten days after the due date for the filing of the last reply brief in the proceeding. Oral arguments will be heard by three Members of the Trademark Trial and Appeal Board at the time specified in the notice of hearing. If any party appears at the specified time, that party will be heard. If the Board is prevented from hearing the case at the specified time, a new hearing date will be set. Unless otherwise permitted, oral arguments in an inter partes case will be limited to thirty minutes for each party. A party in the position of plaintiff may reserve part of the time allowed for oral argument to present a rebuttal argument.

(b) The date or time of a hearing may be reset, so far as is convenient and proper, to meet the wishes of the parties and their attorneys or other authorized representatives.

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within thirty days from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

32. Section 2.131 is revised to read as follows:

**§2.131 Remand after decision in inter partes proceeding.**

If, during an inter partes proceeding, facts are disclosed which appear to render the mark of an applicant unregistrable, but such matter has not been tried under the pleadings as filed by the parties or as they might be deemed to be amended under Rule 15(b) of the Federal Rules of Civil Procedure to conform to the evidence, the Trademark Trial and Appeal Board, in lieu of determining the matter in the decision on the proceeding, may refer the application to the examiner for reexamination in the event the applicant ultimately prevails in the inter partes proceeding. Upon receiving the application, the examiner shall withhold registration pending reexamination of the application in the light of the reference by the Board. If, upon reexamination, the examiner finally refuses registration to the applicant, an appeal may be taken as provided by §§2.141 and 2.142.

33. Section 2.132 is revised to read as follows:

**§2.132 Involuntary dismissal for failure to take testimony.**

(a) If the time for taking testimony by any party in the position of plaintiff has expired and that party has not taken testimony or offered any other evidence, any party in the position of defendant may, without waiving the right to offer evidence in the event the motion is denied, move for dismissal on the ground of the failure of the plaintiff to prosecute. The party in the position of plaintiff shall have fifteen days from the date of service of the motion to show cause why judgment should not be rendered against him. In the absence of a showing of good and sufficient cause, judgment may be rendered against the party in the position of plaintiff. If the motion is denied, testimony periods will be reset for the party in the position of defendant and for rebuttal.

(b) If no evidence other than a copy or copies of Patent and Trademark Office records is offered by any

party in the position of plaintiff, any party in the position of defendant may, without waiving the right to offer evidence in the event the motion is denied, move for dismissal on the ground that upon the law and the facts the party in the position of plaintiff has shown no right to relief. The party in the position of plaintiff shall have fifteen days from the date of service of the motion to file a brief in response to the motion. The Trademark Trial and Appeal Board may render judgment against the party in the position of plaintiff, or the Board may decline to render judgment until all of the evidence is in the record. If judgment is not rendered, testimony periods will be reset for the party in the position of defendant and for rebuttal.

(c) Any motion filed under paragraph (a) or (b) of this section must be filed before the opening of the testimony period of the moving party.

34. Section 2.134 is revised to read as follows:

**§2.134 Surrender or voluntary cancellation of registration.**

(a) After the commencement of a cancellation proceeding, if the respondent applies for cancellation of the involved registration under section 7(d) of the Act of 1946 without the written consent of every adverse party, judgment shall be entered against the respondent.

(b) After the commencement of a cancellation proceeding, if it comes to the attention of the Trademark Trial and Appeal Board that the respondent has permitted his involved registration to be cancelled under section 8 of the Act of 1946 or has failed to renew his involved registration under section 9 of the Act of 1946, an order may be issued allowing respondent until a set time, not less than fifteen days, in which to show cause why such cancellation or failure to renew should not be deemed to be the equivalent of a cancellation by request of respondent without the consent of the adverse party and should not result in entry of judgment against respondent as provided by paragraph (a) of this section. In the absence of a showing of good and sufficient cause, judgment may be entered against respondent as provided by paragraph (a) of this section.

35. Section 2.135 is revised to read as follows:

**§2.135 Abandonment of application or mark.**

After the commencement of an opposition, concurrent use, or interference proceeding, if the applicant files a written abandonment of the application or of the mark without the written consent of every adverse party, judgment shall be entered against the applicant.

36. Section 2.142 is proposed to be revised to read as follows:

**§2.142 Time and manner of ex parte appeals.**

(a) Any appeal filed under the provisions of §2.141 must be filed within six months from the date of final refusal or the date of the action from which the appeal is taken. An appeal is taken by filing a notice of appeal and paying the appeal fee.

(b) The brief of appellant shall be filed within sixty days from the date of appeal. If the brief is not filed within the time allowed, the appeal may be dismissed. The examiner shall, within sixty days after the brief of appellant is sent to the examiner, file with the Trademark Trial and Appeal Board a written brief answering the brief of appellant and shall mail a copy of the brief to the appellant. The appellant may file a reply brief within twenty days from the date of mailing of the brief of the examiner.

(c) All requirements made by the examiner and not the subject of appeal shall be complied with prior to the filing of an appeal.

(d) The record in the application should be complete prior to the filing of an appeal. The Trademark Trial and Appeal Board will ordinarily not consider additional evidence filed with the Board by the appellant or by the examiner after the appeal is filed. After an appeal is filed, if the appellant or the examiner desires to introduce additional evidence, the appellant or the examiner may request the Board to suspend the appeal and to remand the application for further examination.

(e)(1) If the appellant desires an oral hearing, a request therefor should be made by a separate notice filed not later than ten days after the due date for a reply brief. Oral argument will be heard by three Members of the Trademark Trial and Appeal Board at the time specified in the notice of hearing, which may be reset if the Board is prevented from hearing the argument at the specified time or, so far as is convenient and proper, to meet the wish of the appellant or his attorney or other authorized representative.

(2) If the appellant requests an oral argument, the examiner who issued the refusal of registration or the requirement from which the appeal is taken, or in lieu thereof another examiner from the same examining division as designated by the supervisory attorney thereof, shall present an oral argument. If no request for an oral hearing is made by the appellant, the appeal will be decided on the record and briefs.

(3) Oral argument will be limited to twenty minutes by the appellant and ten minutes by the examiner. The appellant may reserve part of the time allowed for oral argument to present a rebuttal argument.

(f)(1) If, during an appeal from a refusal of registration, it appears to the Trademark Trial and Appeal Board that an issue not previously raised may render the mark of the appellant unregistrable, the Board may suspend the appeal and remand the application to the examiner for further examination to be completed within thirty days.

(2) If the further examination does not result in an additional ground for refusal of registration, the examiner shall promptly return the application to the Board, for resumption of the appeal, with a written statement that further examination did not result in an additional ground for refusal of registration.

(3) If the further examination does result in an additional ground for refusal of registration, the examiner and appellant shall proceed as provided by §§2.61, 2.62, 2.63 and 2.64. If the ground for refusal is made final, the examiner shall return the application to the Board, which shall thereupon issue an order allowing the appellant sixty days from the date of the order to file a supplemental brief limited to the additional ground for the refusal of registration. If the supplemental brief is not filed by the appellant within the time allowed, the appeal may be dismissed.

(4) If the supplemental brief of the appellant is filed, the examiner shall, within sixty days after the supplemental brief of the appellant is sent to the examiner, file with the Board a written brief answering the supplemental brief of appellant and shall mail a copy of the brief to the appellant. The appellant may file a reply brief within twenty days from the date of mailing of the brief of the examiner.

(5) If an oral hearing on the appeal had been requested prior to the remand of the application but not yet held, an oral hearing will be set and heard as provided in paragraph (e) of this section. If an oral hearing had been held prior to the remand or had not been previously requested by the appellant, an oral hearing may be requested by the appellant by a separate notice filed not later than ten days after the due date for a reply brief on the additional ground for refusal of registration. If the appellant files a request for an oral hearing, one will be set and heard as provided in paragraph (e) of this section.

(g) An application which has been considered and decided on appeal will not be reopened except for the entry of a disclaimer under section 6 of the Act of 1946 or upon order of the Commissioner, but a petition to the Commissioner to reopen an application will be considered only upon a showing of sufficient cause for consideration of any matter not already adjudicated.

37. Section 2.146 is revised to read as follows:

**§2.146 Petitions to the Commissioner.**

(a) Petition may be taken to the Commissioner: (1) From any repeated or final formal requirement of the examiner in the ex parte prosecution of an application if permitted by §2.63(b); (2) in any case for which the Act of 1946, or Title 35 of the United States Code, or this Part of Title 37 of the Code of Federal Regulations specifies that the matter is to be determined directly or reviewed by the Commissioner; (3) to invoke the supervisory authority of the Commissioner in appropriate circumstances; (4) in any case not specifically defined and provided for by this part of Title 37 of the Code of Federal Regulations; (5) in an extraordinary situation, when justice requires and no other party is injured thereby, to request a suspension or waiver of any requirement of the rules not being a requirement of the Act of 1946.

(b) Questions of substance arising during the ex parte prosecution of applications, including, but not limited to, questions arising under sections 2, 3, 4, 5, 6 and 23 of the Act of 1946, are not considered to be appropriate subject matter for petitions to the Commissioner.

(c) Every petition to the Commissioner shall include a statement of the facts relevant to the petition, the points to be reviewed, the action or relief that is requested, and the requisite fee (see §2.6). Any brief in support of the petition shall be embodied in or accompany the petition. When facts are to be proved in ex parte cases (as in a petition to revive an abandoned application), the proof in the form of affidavits or declarations in accordance with §2.20, and any exhibits, shall accompany the petition.

(d) A petition on any matter not otherwise specifically provided for shall be filed within sixty days from the date of mailing of the action from which relief is requested.

(e)(1) A petition from the denial of a request for an extension of time to file a notice opposition shall be filed within fifteen days from the date of mailing of the denial of the request and shall be served on the attorney or other authorized representative of the applicant, if any, or on the applicant. Proof of service of the petition shall be made as provided by §2.119(a). The applicant may file a response within fifteen days from the date of service of the petition and shall serve a copy of the response on the petitioner, with proof of service as provided by §2.119(a). No further paper relating to the petition shall be filed.

(2) A petition from an interlocutory order of the Trademark Trial and Appeal Board shall be filed within thirty days after the date of mailing of the order from which relief is requested. Any brief in response to the petition shall be filed, with any supporting exhibits, within fifteen days from the date of service of the petition. Petitions and responses to petitions, and any papers accompanying a petition or response, under this subsection shall be served on every adverse party pursuant to §2.119(a).

(f) An oral hearing will not be held on a petition except when considered necessary by the Commissioner.

(g) The mere filing of a petition to the Commissioner will not act as a stay in any appeal or inter partes proceeding that is pending before the Trademark Trial and Appeal Board nor stay the period for replying to an Office action in an application except when a stay is specifically requested and is granted or when §§2.63(b) and 2.65 are applicable to an ex parte application.

(h) Authority to act on petitions, or on any petition, may be delegated by the Commissioner.

**§2.147 [Removed]**

38. Section 2.147 is removed.

39. Section 2.165 is revised to read as follows:

**§2.165 Reconsideration of affidavit or declaration.**

(a)(1) If the affidavit or declaration filed pursuant to §2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the registration or from the date of publication under section 12(c) of the Act. The certificate of mailing procedure provided by §1.8 does not apply to affidavits or declarations or to supplemental or substitute affidavits or declarations filed under section 8 (a) or (b) of the Act, but the certificate of mailing by "Express Mail" procedure provided by §1.10 does apply thereto.

(2) A request for reconsideration shall be a condition precedent to a petition to the Commissioner to review the refusal of the affidavit or declaration unless the first action refusing the affidavit or declaration directs the registrant to petition the Commissioner for relief, in which event the petition must be filed within six months from the date of mailing of the action.

(b) If the refusal of the affidavit or declaration is adhered to, the registrant may petition the Commissioner to review the action under §2.146(a)(2). The petition to the Commissioner requesting review of the action adhering to the refusal of the affidavit or declaration must be filed within six months from the date of mailing of the action which denied reconsideration.

(c) The decision of the Commissioner on the petition will constitute the final action of the Patent and Trademark Office. If there is no petition to the Commissioner, the Commissioner will notify the registrant of the refusal of the affidavit or declaration after the expiration of six years from the date of registration or from the date of publication under section 12(c) of the Act of 1946, and such notice will constitute the final action of the Office.

(d) A petition to the Commissioner for review of the action shall be a condition precedent to an appeal to or action for review by any court.

40. Section 2.173 is amended by revising paragraph (b) to read as follows:

**§2.173 Amendment; disclaimer in part.**

* * * * *

(b) No amendment in the identification of goods or services in a registration will be permitted except to restrict the identification or otherwise to change it in ways that would not require republication of the mark. No amendment seeking the elimination of a disclaimer will be permitted.

* * * * *

41. Section 2.184 is revised to read as follows:

**§2.184 Refusal of renewal.**

(a) If the application for renewal is incomplete or defective, the renewal will be refused. The application may be completed or amended in response to a refusal, subject to the provisions of §2.183. If a response to a refusal of renewal is not filed within six months from the date of mailing of the action, the application for renewal will be considered abandoned. A request to reconsider a refusal of renewal shall be a condition precedent to a petition to the Commissioner to review the refusal of renewal.

(b) If the refusal of renewal is adhered to, the registrant may petition the Commissioner to review the action under §2.146(a)(2). The petition to the Commissioner requesting review of the action adhering to the refusal of the renewal must be filed within six months from the date of mailing of the action which adhered to the refusal. If a timely petition to the Commissioner is not filed, the application for renewal will be considered abandoned.

(c) The decision of the Commissioner on the petition will constitute the final action of the Patent and Trademark Office.

(d) A petition to the Commissioner for review of the action shall be a condition precedent to an appeal to or

action for review by any court.

42. Section 2.186 is revised to read as follows:

**§2.186 Action may be taken by assignee of record.**

Any action with respect to an assigned application or registration which may or must be taken by a registrant or applicant may be taken by the assignee provided that the assignment has been recorded.

DONALD J. QUIGG,
Apr. 28, 1983. *Deputy Commissioner of Patents and Trademarks.*

[FR Doc. 83-13500 Filed 5-20-83; 8:45 am]
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**Department of Commerce**
**Patent and Trademark Office**

37 CFR Parts 1 and 5
[Docket No. 30422-64]
Revision of Foreign Filing License Procedure

**Agency:** Patent and Trademark Office, Commerce.

**Action:** Notice of proposed rulemaking.

**Summary:** The Patent and Trademark Office proposes to revise the rules of practice in patent cases to establish a streamlined procedure for granting a license for foreign filing. The term "transmitting" as used in the proposed rules would include transmittal of technical data to a foreign country for purposes of filing a patent application. The proposed rules also specify the content of a petition for retroactive license. The proposed changes would simplify the obtaining of foreign filing licenses for amendments, modifications, and supplements and would result in reduced work for both patent applicants and the Patent and Trademark Office. At the same time, national security protections would be strengthened.

**Dates:** Comments must be submitted on or before July 20, 1983; a public hearing will be held July 20, 1983; requests to present oral testimony should be received prior to July 13, 1983.

**Addresses:** Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks; Attention: Kenneth L. Cage, Special Laws Administration, Group 220, Room 4-10D17, Washington, D.C. 20231. The hearing will be held in Room 3-11C24 of Building 3, Crystal Plaza, located at 2021 Jefferson Davis Highway, Arlington, VA. Written comments and transcripts of the public hearing will be available for public inspection in Room 3-11A13 of Building 3, Crystal Plaza.

**For Further Information Contact:** Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**Supplementary Information:** Under the present procedures, all licenses for foreign filing of a patent application have the same scope, as set forth in current §5.15. The scope of these licenses, as held by the Court in *In re Gaertner,* 202 USPQ 714 (C.C.P.A. 1979), does not include amendments and modifications of an application which contain additional subject matter.

Under the proposed rules, there would be two types of licenses of differing scope for foreign filing. The first type under §5.15(a), the grant of which would be indicated on the filing receipt in accordance with §5.12(a) published at 48 FR 2696, would permit the transmittal for filing of the application and of any amendments or modifications to the application in a foreign country, even if "additional subject matter" were introduced into the foreign application provided the subject matter did not change the general nature of the subject matter disclosed and did not pertain to certain categories of potentially sensitive material which are set forth in proposed §5.15(a) (1)-(5). This scope of license under §5.15(a) would also be granted under §5.12(b) pursuant to §5.13 petition, if the §5.15(a) scope of license is indicated on the license grant.

The second type of license under §5.15(b) would be limited in scope to the original subject matter disclosed at the time the license was granted and would not cover "additional subject matter" as the phrase is currently interpreted (*In re Gaertner,* 202 USPQ 714 (C.C.P.A. 1979)). The licenses under §§5.12(b), 5.13, and 5.14 would be of the same scope as those granted under present practice unless a §5.15(a) license is indicated on the license grant. If a petition for a license under §5.12(b) is granted prior to the grant of the §5.12(a) filing receipt licenses, the former would merge into the latter and would be considered a §5.12(a) license for the purpose of proposed §5.15.

A new §5.20 is proposed which would set forth in the regulations the requirements to be met for the granting of a retroactive license. The proposed requirements include (1) a list of the foreign countries which received the information; (2) the date(s) of transmittal; (3) an oath or declaration which avers to (i) the non-sensitive nature of the material, (ii) a showing of diligence in attempting to obtain the license upon discovery of the error, and (iii) a showing of facts which support a conclusion of inadvertence; and (4) the required fee. The section as proposed also provides in paragraph (b) for review from a denial of a petition for a retroactive license.

A revised §5.11(a) is proposed which would set forth in the regulations a requirement that a license from the Commissioner of Patents and Trademarks is required before transmitting an application to a foreign country, if the United States application has not been on file for six months, or no application has been filed in the United States. This proposed rule change would more accurately reflect the intent of the statutes and make the rules more closely conform with the regulations of other agencies which deal with the export of technical data to a foreign country. The proposed change requiring a license before transmitting an application to a foreign country is not intended to interpret the language in 35 U.S.C. 184 "file or cause or authorize to be filed" as necessarily requiring a license before an application is transmitted to a foreign country. Further, the proposed change is not intended to imply that every transmission within six months of U.S. filing without a license is prohibited under the existing regulations, such as where an application has been transmitted to a foreign agent without an authorization to file a foreign application. The proposed regulations are intended to change existing practice by requiring a license in all situations to transmit an application abroad. This change is proposed under the authority of 35 U.S.C. 6 to assure adequate protection of sensitive material under title 35 and to provide for consistency with the Arms Control Act and the Export Administration Act and their implementing regulations.

A revised §5.11(b) is proposed which would state that applications under secrecy order under §5.2 cannot be transmitted or filed in a foreign country except in accordance with §5.5.

A revised §5.11(c) is proposed which would state that a license pursuant to paragraph (a) is not required where the invention is not made in the United States, or the U.S. application was on file for six months without a secrecy order being issued.

A new §5.11(d) is proposed which would state that a license for foreign filing may be revoked at any time upon written notice.

Sections 5.1, 5.12(b), 5.13, 5.14, 5.15 and 5.17, as proposed are revised to conform to the §5.11 requirement of a license for transmittal of an application to a foreign country.

Finally, §§5.12(b), 5.13, 5.14, 5.15, and 1.17, as proposed, also would refer to the new fees for these services.

**Discussion of Specific Sections Proposed To Be Changed**

Section 1.17(h) is proposed to be amended to include a specific reference to §5.20 petitions for retroactive licenses for which the petition fee is charged, rather than having the present retroactive license fee under §1.182 petitions. The fee for §5.12(b) licenses is new and is for special handling of these license request.

Section 5.1, as proposed, would reflect the proposed §5.11 license requirement for transmittal to a foreign country.

Section 5.11, as proposed, would require a license for transmitting an application to a foreign country for filing if the U.S. application has not been on file for at least six months prior to the date of transmittal, or no application has been filed in the United States. This will enable the Patent and Trademark Office to better exercise the export control functions set forth in §§5.18 and 5.19 established in accordance with 35 U.S.C. 184, the Arms Control Act of 1977 and the Export Administration Act of 1979, respectively.

Under these Acts, the export of technical data is the activity to be controlled. Proposed §5.11(a) controls export activity by requiring a license for transmittal of technical data in connection with foreign filing of an application and to that extent implements the Arms Control Act and the Export Administration Act. If a license as required by proposed §5.11 is obtained under §§5.12, 5.13 or 5.14, no license for the export of technical data to a foreign country in connection with a patent application is required under the Export Administration Act of 1979 or the Arms Control Act of 1977. It is emphasized that the scope of the license for transmittal of technical data is limited to transmitting an application for foreign filing and does not include selling or using the technical data in a foreign country. These latter acts continue to require separate licenses under the Export Administration Act and the Arms Control Act.

Also, the transmittal of technical data in any form to a foreign country for purposes other than filing or supporting the filing of a patent application or consideration whether a patent application should be filed is not controlled by title 35 United States Code or the exiting or proposed regulations in Part 5. The transmittal of data to a foreign country in such cases would be subject to other laws and regulations such as the export and arms control regulations.

Section 5.11(b), as proposed, states that an application cannot be transmitted to a foreign country when the corresponding United States application is under secrecy order except under §5.5.

Section 5.11(c), as proposed, states that no license is required if the invention was not made in the United States, or the application was on file in the United States at least six months and is not under a secrecy order issued under §5.2.

Section 5.11(d), as proposed, states that any license for foreign filing may be revoked at any time by written notification.

Section 5.12(b), as proposed, would refer to the license fee under proposed §1.17(h).

Section 5.13, as proposed, would refer to the fee under proposed §1.17(h) for a petition for license where no corresponding national or international application has been filed in the United States.

Section 5.14(a), as proposed, would indicate that petitions under this section require a fee as set forth in proposed §1.17(h).

The other changes make grammatical corrections and would not alter the intent of the section.

Section 5.14(c), as proposed, would reflect the proposed §5.11 license requirement for transmittal to a foreign country.

Section 5.15, as proposed, would change the scope of licenses granted under §5.12(a). Paragraph (a) of §5.15 defines the scope of licenses to be granted under §5.12(a), the granting of which is indicated on the filing receipt. This license permits transmitting corresponding subject matter in the application to any foreign country for filing and any amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification or explanation of subject matter disclosed in the application. This includes new matter which does not change the general nature of subject matter disclosed and does not pertain to certain prohibited subjects or areas listed on various export restriction lists. These lists are established by the Department of State, the Department of Commerce, the Department of Energy, and various executive orders and statutes.

These changes also permit an applicant to take action in the prosecution of the foreign or international application and submit supporting data such as affidavits, test data or the like as long as it directly relates to the application and does not pertain to the prohibited subjects or areas enumerated in §5.15(a).

New paragraph (b) of §5.15, as proposed, would define the scope of a license granted under §5.12(b) to be the same as a license granted under the provisions of present §5.15. The existing prohibition against the filing of "subject matter additional to that covered by the license" is being continued. Accordingly, court interpretations of this language would still apply. Only the scope of a §5.12(a) license would be different from foreign filing licenses which have been granted in the past. Subject matter listed in §5.15(a)(1)–(a)(5) would require an additional license, regardless of which provision authorized the original license grant.

New paragraph (c) of §5.15, as proposed, would define the scope of a license granted pursuant of §5.13 to be of the same scope as a paragraph (a) license, if it is indicated on the license grant.

New paragraph (d) of §5.15, as proposed, would provide for a reorganization of paragraphs with no significant change in substance.

New paragraph (e) of §5.15, as proposed, would recite the situations in which a license would be required to file any amendment or other papers abroad. Amendments to applications under both types of licenses are covered. Any amendment to an application licensed under proposed §512(a) requires a separate license only if it pertains to specifically identified areas or subjects. Any amendment to an application licensed under §5.12(b) requires a separate license if the amendment discloses additional subject matter.

Paragraph (f) of §5.15, as proposed, would set forth the licensing requirements for combining or dividing applications. If any of the applications have not been licensed under §5.12(a), then any additional subject matter must be separately licensed. If all of the applications have been licensed under §512(a), then only subject matter listed in paragraph 5.15(a)(1)–(a)(5) need be separately licensed.

Paragraph (g) of §5.15, as proposed, would include a reference to the section dealing with the requirements for a petition for a retroactive license.

Section 5.17, as proposed, would include the transmittal requirement of proposed §5.11 in the use of a license.

Section 5.20, as proposed, is new and would set forth the requirements for seeking a retroactive license.

New §5.20(a) requires identification of the subject matter which is to be licensed as in §§5.13 or 5.14. New §5.20 (a)(1) and (a)(2) identify the specific proscribed transmittal for filing for which the license is made retroactive. New §5.20(a)(3) provides for the specific showing of inadvertence. New §5.20(a)(4) refers to the required fee. New §5.20(b) provides for time periods to renew petitions that have been denied, and procedures to be followed after denial of a renewed petition.

Section 5.23, as proposed, would reflect the new organizational title.

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L.

96-354) for several reasons. Under this proposed rulemaking, small entities would be able to obtain licenses without filing separate requests therefor. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in cost or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This proposed rule change would not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3401 *et seq.*, since no additional recordkeeping or reporting requirements are placed on the public.

**List of Subjects**

*37 CFR Part 1*

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Lawyers, Small businesses.

*37 CFR Part 5*

Classified information, Foreign relations, Inventions and patents.

**Proposed Amendment of Regulations**

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below.

It is proposed to amend 37 CFR, Parts 1 and 5 as follows, with deletions indicated by brackets and additions by arrows:

**PART 1–[AMENDED]**

1. Section 1.17 is proposed to be amended by revising paragraph (h) to read as follows:

**§1.17 Patent application processing fees.**

* * * * *

(h) For filing a petition to the Commissioner under a section of ►Part 1 or 5◄ [this part] listed below which refers to this paragraph, $120.00.

— §1.47 –for filing by other than all the inventors or a person not the inventor
— §1.48 –for correction of inventorship
— §1.182–for decision on questions not specifically provided for
— §1.183–to suspend the rules
— §1.268–for late filing of interference settlement agreement
►— §5.13 and 5.14–for special handling of foreign filing license
— §5.20–for retroactive license◄

**PART 5–[AMENDED]**

2. Section 5.1 is proposed to be amended by revising paragraph (a) to read as follows:

**§5.1 Defense inspection of certain applications.**

(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office and, with respect to inventions made in the United States, to applications filed in any foreign country or any international authority other than the United States Receiving Office. The

(1) ►transmittal for◄ filing of a national or an international application in a foreign country or with an international authority other than the United States Receiving Office, or

(2) transmittal of an international application to a foreign agency or an international authority other than the United States Receiving Office is considered to be a foreign filing within the meaning of Chapter 17 of Title 35, United States Code.

* * * * *

3. The center heading preceding §5.11 and §5.11 are proposed to be amended by revising the center heading and paragraphs (a), (b), and (c), and adding new paragraph (d) to read as follows:

**Licenses for Foreign ►Transmittal or◄ Filing**

**§5.11 License for ►transmitting◄ [filing] application ►on an invention made in the United States to a◄ [in] foreign country [or for transmitting international applications].**

(a) [When no secrecy order has been issued under §5.2, a ] ►A◄ license from the Commissioner of Patents and Trademarks [under 35 U.S.C. 184] is required before [filing] any application for patent or for the registration of a utility model, industrial design, or model [, in a foreign country, or transmitting an international application to any foreign patent agency or any international agency other than the United States Receiving Office, or causing or authorizing such filing or transmittal, with respect to] ►on◄ an invention made in the United States ►can be transmitted to a foreign country (including an international agency in a foreign country) for filing if:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be transmitted, or

(2) No application on the invention has been filed in the United States.

The license from the Commissioner of Patents and Trademarks referred to in this paragraph would be issued pursuant to, and meet the requirements of, 35 U.S.C. 184 and §§5.18 and 5.19 of this part.◄
[, if:

(1) The foreign application is to be filed or its filing caused or authorized before a national or international application for patent is filed in the United States, or

(2) The foreign application is to be filed, or its filing caused or authorized, or the transmittal of the international application is caused or authorized, prior to the expiration of six months from the filing of the application in the United States.]

(b) ►If a secrecy order has been issued under §5.2, an application cannot be transmitted to, or filed in, a foreign country (including an international agency in a foreign country), except in accordance with §5.5.◄ [When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if:

(1) The invention was not made in the United States, or

(2) The foreign application is to be filed or the international application is to be transmitted, or its filing or transmittal caused or authorized, after the expiration of six months from the filing of the national application in the United States.]

(c) ►No license pursuant to paragraph (a) of this section is required if:

(1) the invention was not made in the United States, or

(2) the United States application is not subject to a secrecy order under §5.2, and was filed at least six months prior to the date on which the application is transmitted to a foreign country.◄ [When a secrecy order has been issued under §5.2, an application cannot be filed in a foreign country, nor can an international application be transmitted to any agency other than the United States Receiving Office except in accordance with §5.5.]

►(d) A license pursuant to paragraph (a) of this section can be revoked at any time upon written notification by the Patent and Trademark Office.◄

4. Section 5.12 is proposed to be amended by revising paragraph (b) to read as follows:

**§5.12 Petition for license.**

* * * * *

(b) Petitions for license under 35 U.S.C. 184 should be presented in letter form and [should] ►must◄ include ►any required fee,◄ petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

5. Section 5.13 is proposed to be revised to read as follows:

**§5.13 Petition for license; no corresponding application.**

►If◄ [Where there is] no corresponding national or international application ►has been filed in the United States◄, the petition for license ► under §5.12(b) ◄ must be accompanied by ►any required fee (§1.17(h)) and◄ a legible copy of the material upon which ►a ◄ license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition or requesting letter be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition. [Where an international application is being filed in the United States Receiving Office, the petition may accompany the international application.]

6. Section 5.14 is proposed to be amended by revising paragraphs (a) and (c) to read as follows:

**§5.14 Petition for license; corresponding U.S. application.**

(a) Where there is a corresponding United States application on file ►a◄ [the] petition for license ►under §5.12(b) must include any required fee (§1.17(h)) and ◄ must identify this application by serial number, filing date, inventor, and title, ►but◄ [and] a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.

* * * * *

(c) where the application to be [filed or] transmitted abroad ►for filing◄ contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be ► transmitted for filing◄ [filed] in the foreign country or international application ►as it◄ [which] is to be transmitted to a foreign international or national agency [as it is to be filed] ►for filing◄in the Receiving Office must be furnished with the petition. If, however, all new matter in the foreign or international application to be ► transmitted◄ [filed] is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

7. Section 5.15 is proposed to be amended by revising paragraph (a), redesignating paragraphs (b), and (c) as paragraphs (f) and (g) and revising new paragraphs (f) and (g) and adding new paragraphs (b), (c), (d), and (e) to read as follows:

**§5.15 Scope of license.**

(a) [A]►Grant of a◄ license ►under §5.12 (a) authorizes the transmittal of ◄ [to file] an application ► to◄ [in] a foreign country or [transmit] ►the transmittal of◄ an international application to any foreign ►patent agency◄ or international ►patent◄ agency [other than the United States Receiving Office, when granted,] ►where the subject matter of the foreign or international application corresponds to that of the domestic application. Further, this license◄ includes authority to forward all duplicate and formal papers to the foreign country or international agencies and to make amendments ►, modifications and supplements, including new matter which does not change the general nature of the subject matter disclosed, at the time of transmittal, or later,◄ and ►to ◄ take any action in the prosecution of the foreign or international application [,] ►unless the paper, modification, amendment, supplement of action involves subject matter pertaining to:

(1) Defense services or articles designated in the United States Munitions List applicable at the time of filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act of 1977;

(2) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the Regulations for unclassified Activities in Foreign Atomic Energy Programs;

(3) Articles, materials and supplies, the export of which is prohibited or restricted pursuant to the Export Administration Act of 1979, as implemented by the Export Administration Regulations:

(4) Information subject to classification in accordance with executive orders protecting national security information from disclosure; or

(5) Information, the dissemination, disclosure or exportation of which is restricted by a statute, regulation or executive order which amends or supersedes any of paragraphs (a)(1)–(4) of this section. ◄ [Provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter. Any paper filed abroad or with an international agency following the filing of a foreign or international application which involves the disclosure of additional subject matter must be separately licensed in the same manner as a foreign or international application.]

►(b) Grant of a license under §5.12(b) authorizes the transmittal of an application to a foreign country or the transmittal of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to forward all duplicate and formal papers to the foreign patent agency or international patent agency and to make amendments, modifications or supplements to and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) Grant of a license under §5.12(b) pursuant to §5.13 shall have the same scope of a license granted in paragraph (a) of this section, if it is so specified in the license.

(d) In those cases in which no license is required to transmit the foreign application or the international application, no license is required to transmit papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter.

(e) Any paper transmitted abroad or to an international patent agency following the transmittal of a foreign or international application which involves the disclosure of subject matter listed in paragraphs (a)(1)–(a)(5) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under §5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.◄

►(f)◄ [(b)] Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided◄:

(1) Subject matter listed in paragraph (a)(1)–(a)(5) of

this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under §5.12(b), ◄ additional subject matter is not introduced.

►◄ [(c)] A license does not apply to acts done before the license was granted unless the petition specifically requests and describes the particular acts and the license is worded to apply to such acts. ►See §5.20.◄

8. Section 5.17 is proposed to be revised to read as follows:

**§5.17 Who may use license.**

Licenses may be used by anyone interested in the ►transmitting for◄ foreign filing or international transmittal for or on behalf of the inventor or the inventor's assigns.

9. A new §5.20 is proposed to be added to read as follows:

**►§5.20 Petition for retroactive license.**

(a) A petition for retroactive license under 35 U.S.C. 184 shall be presented in accordance with §5.13 or §5.14, and shall include:

(1) A listing of the foreign countries to which the patent application material was transmitted,

(2) The dates on which the material was transmitted,

(3) A verified statement containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was transmitted and filed abroad, and that is not currently under a secrecy order,

(ii) A showing that the license has been diligently sought after discovery of the proscribed transmittal and foreign filing, and

(iii) An explanation of why the material was inadvertently transmitted and filed broad without the required license under §5.11 first having been obtained, and

(4) The required fee (§1.17(h)).

The above explanation must include a showing of facts from which a conclusion of inadvertence may be drawn rather than a mere allegation of inadvertence. The showing of facts should include statements by those persons having personal knowledge of the acts regarding transmitting and filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute inadvertence should cover the period from the time of transmission until actual filing of the petition under this section.

(b) If a petition for a retroactive license is denied, a time period of not less than thirty days shall be set, during which the petition may be renewed. Failure to renew the petition within the set time period will result in a final denial of the petition. If a renewed petition is denied, the denial is final unless recourse be had under §1.181 within two months of the date of the denial. If the petition for a retroactive license is denied with respect to the invention of a pending application and no petition under §1.181 has been filed, a final rejection of the application under 35 U.S.C. 185 will be made.◄

10. Section 5.23 is proposed to be revised to read as follows:

**§5.23 Correspondence.**

All correspondence in connection with this part, including petitions, should be addressed to "Commissioner of Patents and Trademarks (Attention ►Licensing and Review◄ [Patent Security Division]), Washington, D.C. 20231."

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

May 18, 1983.

[FR Doc. 83-13810 Filed 5-20-83; 8:45 am ]
BILLING CODE 3510-16

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**Department of Commerce**
**Revision of Foreign Filing License Procedure**

[Docket No. 30422-64]
37 CFR Parts 1 and 5

**Agency:** Patent and Trademark Office,Commerce

**Action:** Proposed rule; correction

**Summary:** This document corrects an inadvertent omission of the time 9:00 a.m., for the hearing scheduled for July 20, 1983, in the notice of proposed rulemaking published in 48 FR 23144 on Monday, May 23, 1983, relating to foreign filing license procedure. The paragraph captioned **Dates** is corrected to read as follows:

Comments must be submitted on or before July 20, 1983; a public hearing will be held July 20, 1983, beginning at 9:00 a.m.; requests to present oral testimony should be received prior to July 13, 1983.

**For Further Information Contact:** Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

DONALD J. QUIGG,
*Acting Commissioner of Patents and Trademarks.*

June 2, 1983.

# PATENT NOTICES

**Certificates of Correction for the Week of June 21, 1983**

| | | | |
|---|---|---|---|
| D. 251,425 | 4,344,888 | 4,368,862 | 4,377,291 |
| D. 259,723 | 4,349,787 | 4,369,248 | 4,377,424 |
| D. 267,541 | 4,350,563 | 4,369,455 | 4,377,590 |
| D. 268,292 | 4,350,793 | 4,369,459 | 4,377,753 |
| 3,717,638 | 4,352,325 | 4,369,840 | 4,377,995 |
| 4,094,831 | 4,352,875 | 4,371,154 | 4,378,049 |
| 4,102,635 | 4,354,404 | 4,371,726 | 4,378,362 |
| 4,216,896 | 4,356,584 | 4,372,078 | 4,378,643 |
| 4,249,610 | 4,356,640 | 4,372,891 | 4,378,753 |
| 4,290,085 | 4,362,448 | 4,373,060 | 4,378,860 |
| 4,297,443 | 4,362,924 | 4,373,232 | 4,378,987 |
| 4,297,650 | 4,364,217 | 4,373,436 | 4,379,178 |
| 4,300,231 | 4,364,905 | 4,374,383 | 4,379,481 |
| 4,308,172 | 4,364,947 | 4,374,816 | 4,379,853 |
| 4,317,946 | 4,365,319 | 4,374,879 | 4,380,051 |
| 4,318,916 | 4,365,478 | 4,375,227 | 4,380,200 |
| 4,321,414 | 4,365,497 | 4,375,596 | 4,380,567 |
| 4,327,664 | 4,366,813 | 4,375,764 | 4,380,585 |
| 4,338,172 | 4,366,845 | 4,376,332 | 4,381,033 |
| 4,338,538 | 4,366,928 | 4,376,383 | 4,381,876 |
| 4,340,647 | 4,367,440 | 4,376,681 | 4,382,222 |
| 4,340,929 | 4,367,644 | 4,376,728 | |
| 4,344,137 | 4,367,799 | 4,377,205 | |

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**Disclaimers**

3,715,334.—*Bruce D. Karstedt,* Scotia, N.Y. PLATINUM-VINYLSILOXANES. Patent dated Feb. 6, 1973. Disclaimer filed Apr. 19, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

3,814,730.—*Bruce D. Karstedt,* Charlotte, N.C. PLATINUM COMPLEXES OF UNSATURATED SILOXANES AND PLATINUM CONTAINING ORGANOPOLYSILOXANES. Patent dated June 4, 1974. Disclaimer filed Apr. 19, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 through 8 of said patent.

3,870,909.—*William Walrath Pangburn,* Pattersonville, N.Y. MOUNTING MEANS FOR STANDARDIZED DYNAMOELECTRIC MACHINES. Patent dated Mar. 11, 1975. Disclaimer filed Mar. 31, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1–4 of said patent.

4,297,616.—*Stephen C. Corona,* Rochester, N.Y. FLUORESCENT LAMP WITH INCANDESCENT BALLASTING SYSTEMS. Patent dated Oct. 27, 1981. Disclaimer filed Mar. 4, 1983, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,322,037.—*Dieter Heeb; Gunter Bechmann; Uwe Bergemann; Volker Bollert;* and *Claus-Dieter Frenzel,* Hamburg, Fed. Rep. of Germany. AERSOL CAN, HAVING A SUPER-FINE ATOMIZATION VALVE, WITH A FILLING WHICH CONTAINS A PROPELLANT, PROCESS FOR ITS MANUFACTURE, AND ITS USE. Patent dated Mar. 30, 1982. Disclaimer filed Apr. 20, 1983, by the assignee, *Hans Schwarzkopf, GmbH.*

Hereby enters this disclaimer to all claims of said patent.

4,337,701.—*James G. Janson,* China Lake, Calif. ELECTROMECHANICAL WARHEAD SAFETY-ARMING DEVICE. Patent dated July 6, 1982. Disclaimer filed Apr. 22, 1983, by the assignee, *The United States of America as Represented By The Secretary Of The Navy.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

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**Dedications**

3,367,917.—*Nicholas August Granito,* Wallingford, Conn. MELAMINE-FORMALDEHYDE-BENZO-GUANA-MINE RESIN AND PROCESS FOR PREPARING THE SAME. Patent dated Feb. 6, 1968. Dedication filed Mar. 4, 1983, by the assignee, *American Cyanamid Co.*

Hereby dedicates the remaining term of said patent to the Public.

4,370,675.—*William E. Cohn,* Skokie, Ill. DOORBELL ACTUATED TELEVISION SECURITY SYSTEM. Patent dated Jan. 25, 1983. Dedication filed Apr. 25, 1983, by the assignee, *Zenith Radio Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

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**Disclaimer and Dedication**

4,342,797.—*Alfred E. Kober,* Bridgewater; and *Mark O. Kestner,* Mendham, N.J. WET FLOW CHARACTERISTIC OF COAL AND OTHER WATER-INSOLUBLE SOLID PARTICLES. Patent dated Aug. 3, 1982. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7607 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 571-2122 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4508 |
| Illinois | Chicago Public Library | (312) 269-2865 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, Ext. 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 226 |
| South Carolina | Charleston: Medical University of South Carolina | (803) 792-2372 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 749-4176 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-16-81 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 11-20-81 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 3-1-82 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 3-09-82 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 1-12-82 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 5-22-81 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels, Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 3-30-81 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 1-05-81 |
| RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors. | 5-12-81 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 8-25-80 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 1-30-81 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 5-18-81 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 7-27-81 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 8-27-82 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 11-17-80 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 9-17-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,243,822 to 3,248,737, inclusive

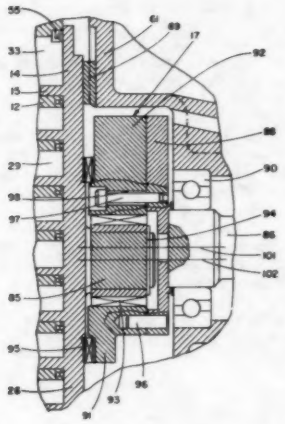
**Plant Patents** ..... Numbers 2,616 to 2,627 inclusive

# REEXAMINATIONS

## JUNE 21, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,082,484 (97th)**
**SCROLL-TYPE APPARATUS WITH FIXED THROW CRANK DRIVE MECHANISM**
**John E. McCullough, Carlisle, Mass., assignor to Arthur Little, Inc., Cambridge, Mass.**
**Reexamination Request No. 90/000,194, Apr. 30, 1982.**
**Reexamination Certificate for Patent No. 4,082,484, issued Apr. 4, 1978, Ser. No. 761,889, Jan. 24, 1977.**
**U.S. Cl. 418/55** **Int. Cl.³ F04C** *17/02; 29/10*




**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

Claims **1** and **2** were previously disclaimed.

Claims **3, 5,** and **7–11,** having been finally determined to be unpatentable, are cancelled.

Claims **4, 6, 12,** and **15** are determined to be patentable as amended:

Claims **13, 14,** and **16–19,** dependent on amended claims, are determined claims, are determined to be patentable.

New claim **20** is added and determined to be patentable.

*20. In a positive fluid displacement apparatus into which fluid is introduced through an inlet port for circulation through said apparatus and subsequently withdrawn through a discharge port, and comprising a stationary scroll member having an end plate and an involute wrap and an orbiting scroll member having an end plate and an involute wrap, driving means for orbiting said orbiting scroll member with respect to said stationary scroll member whereby the side flanks along with said end plates of said involute wraps define at least one moving pocket of variable volume and zones of different fluid pressure, coupling means to maintain said scroll members in fixed angular relationship, the improvement comprising said driving means being arranged to effect the orbiting of said orbiting scroll member such that a small clearance is maintained between said side flanks of said wraps thereby to essentially eliminate wear of said side flanks over extended periods of operation while retaining the essential integrity of said zones of different fluid pressure, said driving means comprising a drive shaft rotatable on a machine axis and connected to the orbiting scroll member through an adjustable fixed-throw crank drive mechanism having means to selectively permit relative angular adjustment between the positions of the crank drive mechanism and the orbiting scroll member, said angular adjustment effecting variation of said clearance, said crank drive mechanism comprising a crank plate assembly affixed to the drive shaft, the crank plate assembly including at least two pieces; a pivot means disposed at an offset location from the machine axis connecting the two pieces together so that the two pieces may be angularly rotated relative to each other about a pivot axis offset from but parallel to said machine axis for effecting said relative angular adjustment; and fastener means for releasably securing said two pieces in fixed angular relationship.*

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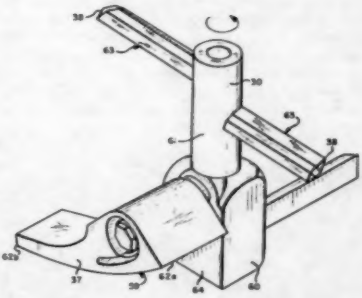
**B1 3,863,006 (98th)**
**METHOD FOR DESENSITIZING TEETH**
**Milton Hodosh, 145 Whitemarsh St., Providence, R.I. 02906**
**Reexamination Request No. 90/000,265, Sep. 29, 1982.**
**Reexamination Certificate for Patent No. 3,863,006, issued Jan. 28, 1975, Ser. No. 327,758, Jan. 29, 1973.**
**U.S. Cl. 424/49** **Int. Cl. A61K** *7/16*




**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

The patentability of claims **1–6** is confirmed.

**1.** The method of desensitizing hypersensitive dentin and cementum by applying thereto an agent, the essential ingredient of which is a nitrate of one of the following alkali metals: potassium, lithium or sodium said nitrate comprising between 1 percent and 20 percent by weight of said agent.

**B1 4,219,318 (99th)**

## APPARATUS FOR PRESERVING FRESH FARINACEOUS PASTES

**Alfredo Cavalli, 9 via Galileo Galilei, Pessano con Bornago, Milan, Italy**

**Continuation-in-part of Ser. No. 798,144, May 18, 1977, abandoned.**

**Reexamination Request No. 90/000,230, Jul. 21, 1982.**

**Reexamination Certificate for Patent No. 4,219,318, issued Aug. 26, 1980, Ser. No. 10,089, Feb. 7, 1979.**

**Claims priority, application Italy, May 19, 1976, 23392A/76.**

**U.S. Cl. 425/190** **Int. Cl.³ B29B 1/06**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** having been finally determined to be unpatentable, is cancelled.

Claims **2, 4–6, 11, 17, 19,** and **20** are patentable as amended:

Claims **3, 7–10, 12–16, 18,** and **21–23** dependent on amended claims, are determined to be patentable.

New claims **24–27** are added and determined to be patentable.

**5.** [An apparatus according to claim **1**] *In an apparatus for preparing fresh food paste from paste forming contents of the type including a vessel having a bottom and forming a mixing and kneading chamber for said paste forming contents, said vessel having a closed side wall of circular cross section which is symmetrical about a vertical axis passing centrally through said chamber, a rotatable member mounted within said chamber for rotation about said vertical axis, drive means for rotating said member in a given direction, blade means located in said mixing and kneading chamber and means operatively connecting said blade means to said rotatable member in a position extending away from said vertical axis, wherein the improvement comprises said blade means including a kneading blade extending into close confronting spaced relation with said side wall of said vessel and having a lower surface with leading and trailing edges defined by said rotation in a given direction, said trailing edge having a normal position adjacent said bottom and being moveable away from said bottom and said leading edge being positioned at a substantially greater distance from said bottom than said normal position of said trailing edge; and means for biasing said trailing edge towards said bottom for causing said kneading blade to exert downward pressure on paste forming contents between said lower surface of said kneading blade and said bottom during the rotation of said rotatable member to effect the kneading of said contents,* [wherein] said blade means [includes] *including* a scraper blade extending substantially radially of said vertical axis and in close proximity to said bottom of said vessel for dislodging paste from said bottom during rotation of said rotatable member.

**11.** [An apparatus according to claim **1**] *In an apparatus for preparing fresh food paste from paste forming contents of the type including a vessel having a bottom and forming a mixing and kneading chamber for said paste forming contents, said vessel having a closed side wall of circular cross section which is symmetical about a vertical axis passing centrally through said chamber, a rotatable member mounted within said chamber for rotation about said vertical axis, drive means for rotating said member in a given direction, blade means located in said mixing and kneading chamber and means operatively connecting said blade means to said rotatable member in a position extending away from said vertical axis, wherein the improvement comprises said blade means including a kneading blade extending into close confronting spaced relation with said side wall of said vessel and having a lower surface with leading and trailing edges defined by said rotation in a given direction, said trailing edge having a normal position adjacent said bottom and being moveable away from said bottom and said leading edge being positioned at a substantially greater distance from said bottom than said normal position of said trailing edge; and means for biasing said trailing edge towards said bottom for causing said kneading blade to exert downward pressure on paste forming contents between said lower surface of said kneading blade and said bottom during the rotation of said rotatable member to affect the kneading of said contents, said apparatus* further comprising means forming an extrusion chamber beneath said bottom of said vessel, said bottom having a discharge port located therein off of said vertical axis for allowing said kneading blade to push paste forming contents from said mixing and kneading chamber into said extrusion chamber.

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### Errata

The Official Gazette Notice for Reexamination Certificate B1 4,144,212, issued Apr. 5, 1983, erroneously included a Claim 9. This claim was proposed and rejected during reexamination. All claims for the patent were determined to be unpatentable and were cancelled.

# REISSUES

## JUNE 21, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 31,280**

**ELECTROCHROMIC DISPLAY DEVICE MANUFACTURE METHOD**

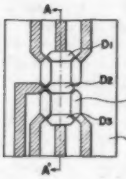
**Kozo Yano, Yamatokoriyama; Yasuhiko Inami, Nishinomiya; Hiroshi Hamada, Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Original No. 4,123,841, dated Nov. 7, 1978, Ser. No. 727,448, Sep. 28, 1976. Application for reissue Oct. 14, 1981, Ser. No. 311,276**

**Claims priority, application Japan, Sep. 29, 1975, 50-118104**

**Int. Cl.³ B01J *17/00*; G02F *1/133***

**U.S. Cl. 29—592 R** **13 Claims**




1. An electrochromic display device [manufacture] *manufacturing* method comprising the steps of:

preparing a first substrate and a second substrate, at least one of said substrates being transparent;

applying a first electrode on said first substrate and a second electrode on said second substrate, at least one of said electrodes being transparent and being applied on a transparent said substrate and said second electrode serving as a counter electrode[;], *and*

applying a layer of transition metal oxide material on said first electrode[;], *wherein*

[initially applying] said first electrode and said transition metal oxide layer *are* successively *applied* on said first substrate over an area greater than that necessary to define a required display segment and external circuit connection pattern thereon;

forming a mask defining said required pattern on said transition metal oxide layer;

applying at least one layer of insulatory material which covers those portions of said transition metal oxide layer which are unrequired for display purposes;

successively etching said transition metal oxide layer and said first electrode through said mask *in discrete steps and with respectively discrete etchants peculiar thereto*, thereby producing said required pattern in said transition metal oxide layer and said first electrode;

positioning said first substrate assembly and said second substrate assembly in an electrode facing relationship and joining said assemblies by spacer means; and

introducing electrolyte into the space defined between said assemblies and said spacer means, said elecrolyte being retained in said space.

**Re. 31,281**

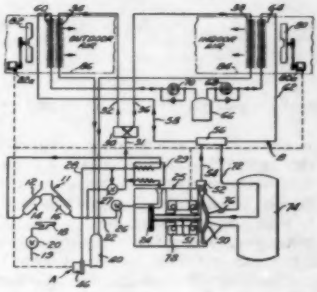
**HEAT PUMP SYSTEM**

**Paul F. Swenson, Shaker Heights, Ohio, and Paul B. Moore, Fedhaven, Fla., assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio**

**Original No. 4,055,964, dated Nov. 1, 1977, Ser. No. 737,776, Nov. 1, 1976. Application for reissue Oct. 25, 1979, Ser. No. 88,174**

**Int. Cl.³ F25B *13/00***

**U.S. Cl. 62—160** **23 Claims**



*16. A fluid heating and cooling system comprising:*

*a refrigeration circuit having a compressor with an inlet and an outlet, an indoor refrigeration circuit heat exchanger, and an outdoor refrigeration circuit heat exchanger,*

*a vapor power circuit having a vapor generator with an inlet and an outlet, a prime mover expander having an inlet and an outlet, means connecting said vapor generator outlet with said prime mover expander inlet, an indoor vapor power circuit heat exchanger, and an outdoor vapor power circuit heat exchanger,*

*first fluid moving means for conducting a first fluid across both of said indoor heat exchangers,*

*second fluid moving means for conducting a second fluid across both of said outdoor heat exchangers,*

*means for drivingly interconnecting said prime mover expander with said compressor,*

*first valve means movable to a cooling position for discontinuing flow of vapor from said prime mover expander outlet to said vapor power circuit indoor heat exchanger when said prime mover expander is drivingly connected to said compressor,*

*second valve means movable to a heating position for discontinuing flow of vapor from said prime mover expander outlet to said vapor power circuit outdoor heat exchanger when said prime mover expander is drivingly connected to said compressor,*

*third valve means movable to a cooling position for connecting said compressor outlet to said refrigeration circuit outdoor heat exchanger when said first valve means is in said cooling position,*

*fourth valve means movable to a heating position for connecting said compressor outlet to said refrigeration circuit indoor heat exchanger when said second valve means is in said heating position.*

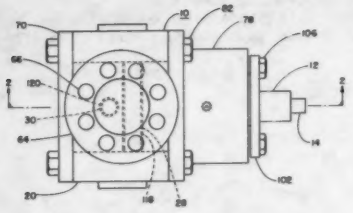
## Re. 31,282
## SHOT-FEEDING METERING VALVE

**James R. Ware, Pasadena, Tex., assignor to National Petro Chemicals Corporation, New York, N.Y.**

**Original No. 4,155,488, dated May 22, 1979, Ser. No. 852,658, Nov. 18, 1977. Application for reissue Mar. 26, 1981, Ser. No. 247,651**

**Int. Cl.³ B67D *5/54***

**U.S. Cl. 222—305** **9 Claims**



1. A metering plug valve of the shot-feeding type comprising:

a. a valve body having an annular recess formed therein and located symmetrically about an axis of rotation, at least first and second sets of oppositely disposed inlet and outlet passageways extending through said valve body and communicating with said recess; and

b. a generally cylindrical valve plug rotatably mounted in said recess for rotational movement about said axis of rotation, at least two nonintersecting linear valve [ports] *bores* extending through said valve plug along straight lines in parallel spaced planes, said valve [ports] *bores* being spaced from each other along said axis of rotation and passing through said axis of rotation, each said valve [port] *bores* respectively connecting an inlet passageway with an outlet passageway upon said valve plug being in a predetermined rotational position in said valve body.

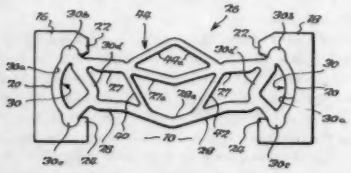
## Re. 31,283
## ELASTOMERIC EXPANSION SEAL

**Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Amherst, N.Y.**

**Original No. 4,179,226, dated Dec. 18, 1979, Ser. No. 947,489, Oct. 2, 1978. Application for reissue Apr. 13, 1981, Ser. No. 253,784**

**Int. Cl.³ E01C *11/04***

**U.S. Cl. 404—68** **15 Claims**



1. An expansion joint seal for bridging and sealing a gap between a pair of spaced-apart elongated edge members being respectively disposed in a pair of structural slabs to define the gap therebetween, each said edge member having in cross-section a generally C-shaped cavity with a preselected radius of curvature, each said cavity opening towards said gap defined between said edge members wherein each said cavity opening is defined between opposed projecting portions of said respective edge members spaced from each other at a distance less than the maximum dimension within said cavity taken generally parallel to said opening, said seal comprising:

a web portion spanning said gap and a mounting bead portion extending along each longitudinal edge of said web portion wherein each of said mounting bead portions is received within said cavity of a corresponding edge member, and each said mounting bead having in cross-section an outer surface portion for matching engagement with said cavity with opposed portions of said mounting bead correspondingly abutting said opposed projecting portions of said edge member whereby relative lateral movement of said mounting bead with respect to said edge member is resisted and, said web portion including upper and lower walls spaced apart from one another to span said gap and being attached along their longitudinal edges to correspondingly upper and lower portions of said mounting bead portions wherein each of said walls includes a longitudinal, downwardly extending fold located substantially along the center line of said gap, said web portion further including a pair of strut members extending between said walls in a downwardly converging relationship with respect to one another for coordinating the movement of said walls during expansion and contraction of said seal, and the upper surface of said upper wall having an inverted V-shaped crown portion joined thereto and located substantially along the center line of said gap whereby the apex of said crown portion is adapted to remain disposed below the upper surface of the structural slabs associated therewith throughout the operational range of said seal.

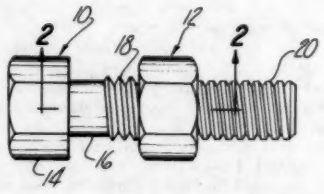
## Re. 31,284
## LOCKING FASTENER

**Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018**

**Original No. 4,150,702, dated Apr. 24, 1979, Ser. No. 876,863, Feb. 10, 1978. Application for reissue Apr. 13, 1981, Ser. No. 253,464**

**Int. Cl.³ F16B *39/30***

**U.S. Cl. 411—311** **10 Claims**



1. In a prevailing-torque fastener combination;

a first element having a helical thread form with leading and trailing flanks which lie at respective first angles to the thread axis and which, before threaded engagement with another element, [intersect] *converge* to define a crest of substantially constant diameter over the working length of said element;

a second element having a helical thread form with leading and trailing flanks which lie at respective second angles relative to the thread axis and which are [truncated] *foreshortened* to define a root surface;

the first and second elements being conjugally threadable with one another;

at least a portion of the second element having a thread depth of lesser dimension than the thread depth of the first element thereby to cause firm radial engagement between the crest of the first element and the root surface when said elements are at least substantially fully threaded together;

[the threads of said elements being configured] *at least one*

*of said second angles being greater than the corresponding one of said first angles by an angle of no greater than about 15°* to create longitudinal clearance between the flanks adjacent the engaging crest and [truncated] root sufficient to receive deformed material from said engaging crest when threaded together.

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## Re. 31,285
## METHOD FOR MANUFACTURING A FILTER OF ELECTRICALLY CHARGED ELECTRET FIBER MATERIAL AND ELECTRET FILTERS OBTAINED ACCORDING TO SAID METHOD

**Jan van Turnhout, Pijnacker, and Johannes C. Rieke, Delft, both of Netherlands, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Original No. 4,178,157, dated Dec. 11, 1979, Ser. No. 862,768, Dec. 21, 1977. Application for reissue Dec. 7, 1981, Ser. No. 328,027**

**Claims priority, application Netherlands, Dec. 23, 1976, 7614376**

**Int. Cl.³ B03C *3/00*; B29C *24/00***

**U.S. Cl. 55—155** **10 Claims**

1. A method for manufacturing a filter of electrically charged electret fiber material, consisting of a high-molecular weight, non-polar polymeric substance, comprising the steps of: continuously supplying a foil of said substance, drawing, charging and fibrillating of the foil and the processing of the thus obtained filter material into a filter, selecting the foil and/or the type of drawing to manufacture spontaneously crimpable fiber material, winding said material in uncrimped condition to a fibrous package and subsequently effecting crimping to interlock the fibers of said fibrous package.

*7. An electret fibrous web comprising fibers fibrillated from a film of a high-molecular-weight nonpolar substance and which contain electric charges embedded therein so as to enhance filtration properties of the web, said fibers being crimped after fibrillation and intermeshed with one another, said fibrous web being capable of being loaded with high amounts of dust while still maintaining high filtration efficiency.*

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## Re. 31,286
## PRODUCTION OF ELECTROLYTIC BATTERY ACTIVE MANGANESE DIOXIDE

**Peter K. Everett, Castlecrag, New South Wales 2068, Australia**

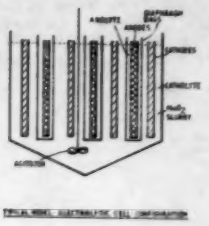
**Original No. 3,951,765, dated Apr. 20, 1976, Ser. No. 531,800, Dec. 11, 1974. Application for reissue May 22, 1980, Ser. No. 152,505**

**Claims priority, application Australia, Dec. 20, 1973, 6071/73**

**Int. Cl.³ C25B *1/00***

**U.S. Cl. 204—96** **10 Claims**

1. A process for the production of high grade $\gamma MnO_2$ from manganese dioxide ore in an electrochemical cell having one or more inert anodes, immersed in an aqueous anolyte having a solution manganese content of 20 g/l Mn to 200 g/l Mn and an acidity of up to 5N, and one or more inert cathodes, immersed in a slurry consisting of particulate manganese dioxide ore and an aqueous catholyte having a solution manganese content of 30 g/l Mn to 220 g/l Mn and a pH below 7, the anodes and cathodes disposed on opposite sides of one or more porous diaphragms, the process consisting of applying a direct current potential between the anodes and cathodes to reduce the manganese dioxide slurry to ionic manganese which diffuses through the diaphragms and is oxidised at the anodes where $\gamma MnO_2$ is formed, the anode current density being 20 to 250 Amp/$m^2$ at a cell temperature of from [15 to 25° C.] *80° to 100° C.* or 1,000 to 4,000 Amp/$m^2$ at a cell temperature of



[80° to 100° C.] *15° to 25° C.* and the cathode current density being 5 to 400 Amps/$m^2$.

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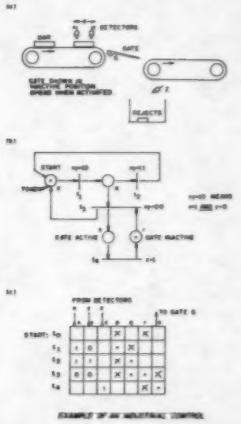
## Re. 31,287
## ASYNCHRONOUS LOGIC ARRAY

**Suhas S. Patil, Salt Lake City, Utah, assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Original No. 4,068,214, dated Jan. 10, 1978, Ser. No. 751,519, Dec. 16, 1976. Continuation of Ser. No. 654,943, Feb. 3, 1976, abandoned. Application for reissue Jan. 10, 1980, Ser. No. 110,838**

**Int. Cl.³ H04G *5/14***

**U.S. Cl. 340—825.79** **7 Claims**



1. A logic array comprising a plurality of groups of column conductors and plurality of groups of row conductors arranged in a substantially orthogonal relationship, each group of column conductors being called a column, each group of row conductors being called a row, and each row and each column is connected by one of at least five types of connections which are characterized as a "dot" connection, a "cross" connection, a "1" connection, a "0" connection and a "null" connection;

each column and row being in one of two states, an "ON" state and an "OFF" state;

a row "firing" when every column connected to that row by a "dot" or a "1" connection is "ON" and every column connected to that row by a "0" connection is on "OFF";

means to change the state of the columns in response to "firings" of rows, the said means turning "OFF" columns connected to a "firing" row by a "dot" connection, and

said means changing the state of the columns connected to a "firing" row by a "cross" connection;

a plurality of arbiters,

each arbiter being connected to plurality of selected rows, the rows which are not connected to an arbiter firing independently of another where as those rows connected to an arbiter "fire" in succession and not at the same time;

means for connecting inputs to selected columns to cause the states of the selected columns to be altered in accordance with changes in the state of inputs, means for connecting selected columns to provide outputs where the state of the output is determined by the state of the selected columns.

# PLANT PATENTS

## GRANTED JUNE 21, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**5,062**

### CHRYSANTHEMUM NAMED BURGUNDY

**Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, Parrish, Fla.**

**Filed Oct. 22, 1981, Ser. No. 313,934**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—76** **1 Claim**

1. A new and distinct dark pink decorative chrysanthemum, substantially as herein shown and described, particularly characterized by the slightly quilled formation of its ray florets which reveal the pale pink coloration of the under side, and its adaptability for five or six inch pot culture the year around under photoperiod control.

# PATENTS

## GRANTED JUN. 21, 1983

### ERRATA

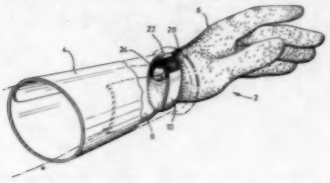
| For CLASS | See PATENT NO. |
|---|---|
| 162–088 | 4,388,745 |
| 073–428 | 4,388,839 |
| 604–319 | 4,388,922 |
| 604–352 | 4,388,923 |
| 339–126 | 4,389,021 |
| 436–002 | 4,389,217 |
| 427–213 | 4,389,330 |
| 427–213 | 4,389,331 |
| 419–008 | 4,389,362 |
| 377–020 | 4,389,563 |
| 382–026 | 4,389,633 |
| 382–011 | 4,389,634 |
| 365–104 | 4,389,705 |

# PATENTS

## GRANTED JUNE 21, 1983

## GENERAL AND MECHANICAL

**4,388,733**
**PROTECTIVE BUTCHERS GLOVE**
**Maurice Anstett, 414 Wellington St. N., Kitchener, Ontario, Canada (N2H 5L2)**
**Filed May 29, 1981, Ser. No. 268,653**
**Int. Cl.³ A41D *19/00***
**U.S. Cl. 2—161 R** **5 Claims**



**1.** A protective glove for butchers, comprising a chain mesh glove portion configured to cover at least the thumb and index finger of a wearer's hand, a semi-rigid wrist guard configured to shield the area extending not substantially more than half way around a user's forearm proximate the wrist joint, the shielded area including the front of the wrist and the area beneath the base of the thumb, and a flexible wrist band which both connects the wrist guard to the glove portion in overlapping relationship and is adapted to secure the glove around the wearer's wrist.

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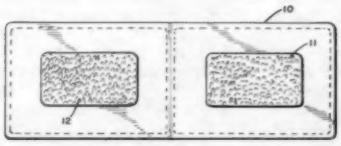
**4,388,734**
**PERSONAL PROPERTY SECURITY SYSTEM**
**Reuel W. Cowden, 536 Cassville Rd., Cartersville, Ga. 30120**
**Filed Oct. 12, 1978, Ser. No. 343,193**
**Int. Cl.³ A41D *27/20***
**U.S. Cl. 2—250** **7 Claims**



**1.** A planar pocket insert device including an I-shaped, thin, flexible base element having rounded extended feet sections, a narrowed central region, and rounded-tapered upper arm sections, which base element is adapted to fit snugly within a clothing pocket, and engagement means to secure an item of personal property thereto.

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**4,388,735**
**LOW PROFILE PROSTHETIC XENOGRAFT HEART VALVE**
**Marian I. Ionescu, Leeds, England; Jay A. Lenker, Laguna Beach, Calif.; Robert F. Rosenbluth, Laguna Niguel, Calif., and Louis Seiler, Jr., Huntington Beach, Calif., assignors to Shiley Inc., Irvine, Calif.**
**Filed Nov. 3, 1980, Ser. No. 203,804**
**Int. Cl.³ A61F *1/22***
**U.S. Cl. 3—1.5** **34 Claims**

**8.** In a xenograft heart valve prosthesis which comprises a circumferentially annular stent having an annular base and legs extending vertically from the base toward the outflow end of the valve, a sewing ring circumferentially attached annularly to the outside of the stent, and a three-cusp tissue valve element attached to the stent, the improvement wherein the valve element comprises three tissue leaflets joined to form a generally cylindrical valve element having three truncated triangular portions extending centrally of each of the cusps respectively toward the outflow end of the valve each having a plateau centrally between the legs extending in the outflow

direction of the valve beyond the ends of the legs, the valve element forming in the open position a cylinder having three truncated triangles on the outflow end thereof and in the closed position three cusps arcing inwardly between the legs, the outflow end of the leaflets touching with the three plateaus adjacent each other in the center of the outflow end of the valve.

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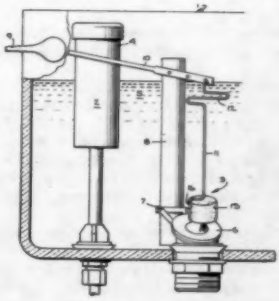
**4,388,736**
**TANK FLUSHING MEANS**
**Peter V. Roosa, 253 Fairview Ave., West Hartford, Conn. 06514, and Vernon D. Roosa, 184 Wood Pond Rd., West Hartford, Conn. 06107**
**Filed Jun. 4, 1981, Ser. No. 270,368**
**Int. Cl.³ E03D *1/14***
**U.S. Cl. 4—324** **2 Claims**



**1.** In a flush tank having a movably mounted flush valve in the bottom which is normally moved to an open position by a handle operated means and which is kept open by the liquid in the tank and which also closes as a result of the flow of the liquid from the tank, the improvement comprising a relatively rigid coupling member operatively connecting the handle to the flush valve whereby said flush valve may also be closed by the said handle at any time during the flushing action and while the tank still contains a substantial volume of liquid, said coupling member comprising a relatively rigid rod with means for connecting opposite ends to said lever and to said flush valve and being capable of transmitting both upward opening and downward closing force to said flush valve, and said rod comprising a bendable metallic rod having a bent length adjusting

and a second bent section, and a float member mounted in said second bent section.

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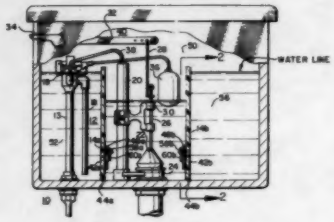
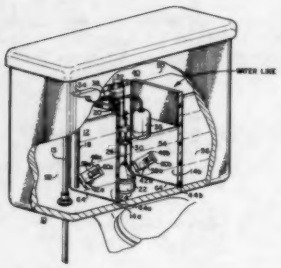
4,388,737

## TOILET TANK INSERT WATER SAVER

John G. Wenzel, 422 Crotzer Ave., Folcroft, Pa. 19032

Filed Oct. 16, 1981, Ser. No. 312,085
Int. Cl.³ E03D *1/00, 1/24, 1/20, 5/00*
U.S. Cl. 4—415 14 Claims




1. A tank for use in conjunction with a toilet having a bottom floor, a plurality of upstanding walls and flushing apparatus comprising:

partitions dividing said tank into first, second, and third water-retaining compartments for conserving water during flushing of said toilet,

portholes predeterminedly positioned in said partitions within close proximity to the bottom floor of said tank to provide for water flow from said first and third compartments into said second compartment during flushing of said toilet,

gates pivotally mounted to said partitions to cover and uncover said portholes, and

attachment means fastened to said gates to set the degree of gate rotation required for controlling the rate of water flow into said second compartment through said portholes during flushing.

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4,388,738

## MATTRESS CONSTRUCTION AND MATTRESS COVER THEREIN

Robert F. Wagner, Lombard, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

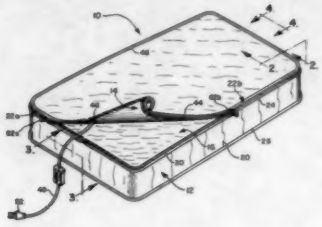
Filed Feb. 23, 1981, Ser. No. 237,389
Int. Cl.³ A47C *21/00*
U.S. Cl. 5—421 20 Claims

1. A mattress cover comprising:

a facing panel;

a heat panel overlying at least a portion of said facing panel, said heat panel comprising an upper section, a backing section, and means for generating heat, said heat generating means disposed between said upper and backing sections;

means for fastening said facing panel to said heat panel comprising at least one complementary pair of interlocking members comprising a first and a second locking



member, said first locking member being secured to said facing panel, and second locking member being secured to said heat panel, and said first and second locking members being adjustable between an interlocked position, bridging said facing and heat panels, and an open position; and

means for securing said facing panel to a mattress core.

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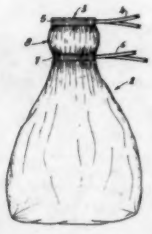
4,388,739

## WASHING BAG FOR CURTAINS, DRAPES AND THE LIKE

Gérard R. Martinon, 3, rue de la Terrace; Jean-Louis Dayme, 38, rue Franklin, both of Lyons (Rhone), and Roger J. Martinon, Lieu dit "Les Forets", Lachassagne (Rhone), all of France

Filed Feb. 17, 1981, Ser. No. 234,806
Claims priority, application France, Feb. 18, 1980, 80 03878; Jan. 6, 1981, 81 00357
Int. Cl.³ D06F *35/00*
U.S. Cl. 8—150 5 Claims



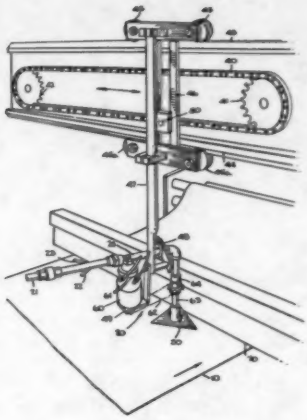
1. A washing bag for the washing of drapery fabric articles with suspension elements attached, comprising an openwork sack composed of a net fabric and formed with a mouth, a first drawstring closure extending around said mouth, a second drawstring closure spaced from said first drawstring closure for constricting a neck of said sack to define between said drawstring closures an auxiliary compartment for said elements, and means for limiting the penetration of said elements through the wall of said auxiliary compartment.

4,388,740

## FOAM RANDOM DYEING SYSTEM

Larry G. Smith, North Augusta, S.C., assignor to United Merchants & Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 80,062, Sep. 28, 1979, Pat. No. 4,282,729.
This application Sep. 2, 1980, Ser. No. 183,615
Int. Cl.³ D06B 1/00
U.S. Cl. 8—151 2 Claims



1. A method of foam dyeing a textile fabric to impart a generally random coloring effect thereto, the method comprising the steps of:

moving the fabric to be treated along a substantially horizontal path through a foam application station;

mixing a foam composition and coloring agent into a non-homogeneous mixture having said coloring agent dispersed therein;

conducting said non-homogeneous mixture to a mixture delivery means disposed above and spaced from the substantially horizontal fabric being treated;

moving said mixture delivery means in a direction transverse to the horizontal direction of movement of the textile fabric and feeding downwardly said non-homogeneous mixture onto the textile fabric from said mixture delivery means;

directing the flow of said non-homogeneous mixture, at least partially, in a direction substantially parallel to the surface of the horizontally disposed textile fabric being treated prior to depositing said non-homogeneous mixture onto the textile fabric; and

further moving said mixture delivery means in a generally rotary direction so as to deposit said non-homogeneous mixture onto the textile fabric in a substantially random pattern thereby imparting the generally random coloring effect thereon.

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4,388,741

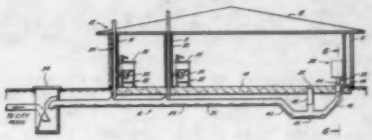
## AUTOMATIC SEWER CLEANING SYSTEM

Everett C. Breon, Houston, Tex., assignor to Kamal Banani Haghighi, Houston, Tex.

Continuation-in-part of Ser. No. 71,501, Aug. 31, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,827
Int. Cl.³ B08B 9/06
U.S. Cl. 15—104.3 SN 7 Claims

1. A system for cleaning the sewer line of a building, the sewer line having a plurality of plumbing fixtures connected thereto, the system comprising:

a cleaning cable permanently installed in the sewer line, said cleaning cable being permanently distorted at points along its length in alternate direction about an axis transverse to said length and being flexible along the remainder of its length such that said cable can conform to bends in the sewer line and can conform to a spiral upon rotation and such that when said cable is at rest, said cable will lie substantially flat on the bottom of the sewer line; and



drive means for rotating said cable such that said cable cleans out such sewer line, said drive means including a drive system having a rotating output and coupling means for connecting said cable to the rotating output of said drive system.

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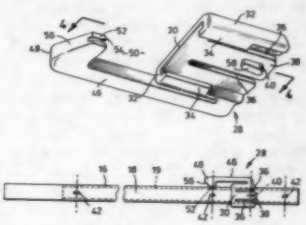
4,388,742

## RETAINER CLIP AND RETAINER CLIP BACKING MEMBER COMBINATION FOR WINDSHIELD WIPER BLADE ASSEMBLIES

Edward G. Kimber, Carlisle, and Peter C. Norris, Oakville, both of Canada, assignors to Tridon Limited, Hamilton, Canada

Filed Sep. 3, 1981, Ser. No. 299,266
Int. Cl.³ B60S 1/02
U.S. Cl. 15—250.42 18 Claims



1. A retainer clip for use in association with a windshield wiper of the type comprising:

a pressure-applying superstructure having along its length a plurality of pairs of opposed mounting claws,

an elongated squeegee, and

a backing member in which the squeegee is mounted and which is in turn mounted on the superstructure by engagement of the mounting claws therewith, the backing member having an upper surface thereof and having on opposite sides thereof respective opposed parallel longitudinally-extending edges which are embraced by the claws;

the clip comprising:

a claw-pair-like clip body constituted by a top wall, two spaced parallel side walls at each side of the top wall, and two inwardly-protruding portions one at each side of each respective side wall, the clip body being adapted to embrace the backing member upper surface and side edges and being capable of sliding movement along the backing member,

the top wall having a flexible member movable towards and away from the backing member, one of the flexible member and the upper surface of the backing member having a projection for engagement in a cooperating recess in the other to retain the clip against longitudinal movement on the backing member,

the clip body having extending longitudinally therefrom a transversely movable hook member providing between itself and the clip body a space in which a mounting claw

can be positioned to retain the clip member against longitudinal movement relative to the superstructure and thereby also retain the backing member against longitudinal movement relative to the superstructure.

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4,388,743

## LID HANDLE COVER

David L. Hellinger; Gordon D. Bell, both of Fort Wayne; Gregory N. Brown, Lafayette; Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, all of Ind., assignors to Lincoln Manufacturing Co., Inc., Fort Wayne, Ind.

Filed Oct. 22, 1980, Ser. No. 199,572
Int. Cl.³ A47J 45/10
U.S. Cl. 16—116 A 8 Claims

1. In combination with a cooking utensil lid having on its surface an upstanding generally centrally located handle having a central portion to be gripped by a user when removing or replacing the lid and downwardly depending legs attaching the handle to the lid, a one piece removable heat insulating cover of low thermal conductivity having a hand grip portion for substantially surrounding the lid handle central portion, a pair of closely adjacent portions depending generally vertically downwardly from the hand grip portion to lie between the legs underneath the central portion of the handle and extending toward the lid surface, the hand grip portion comprising a bight between the closely adjacent portions, and a protective portion comprising a pair of protective flaps adapted to lie closely adjacent the lid surface covering the region of that surface to prevent a user's hand from contacting the lid when grasping the hand grip portion, said protective flaps extending laterally outward of said hand grip portion, said closely adjacent portions being set inwardly of said hand grip portion so as to form a shoulder between the closely adjacent portions and the hand grip portions, said shoulder having a pair of lower internal surfaces adapted to engage an underneath surface of the handle and an external surface adapted to be gripped by the user's fingers, said hand grip portion having an internal upper surface opposite said internal lower surfaces and generally parallel thereto defining a channel for enclosing the handle central portion, the cover resiliently encircling the lid handle central portion with the internal surfaces of said shoulder being in close proximity to the handle when released by the user.

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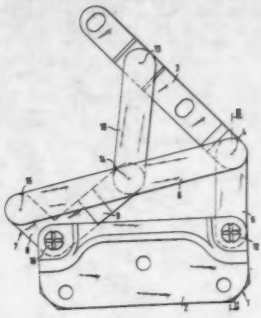
4,388,744

## MOTOR VEHICLE HINGE

Reinhard Pantke, Monsheim, and Konrad Hofmann, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,074
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947202
Int. Cl.³ E05D 3/04
U.S. Cl. 16—273 6 Claims

1. A motor vehicle hinge of the type used on a hood, trunk lid, or the like of a motor vehicle, comprising a plurality of rigid arms, spacer rings, at least one of which is formed of thermoplastic material, provided between the arms, and rivets extending through said rigid arms and spacer rings, said rivets being deformed in a manner holding adjacent surfaces of the arms and the at least one thermoplastic spacer ring in flush contact with one another, wherein prestressing of said thermo-



plastic spacer ring created by said deformation of the rivet holding said arms and thermoplastic spacer has been relieved by annealing of the hinge, whereby the arms are able to pivot while being substantially free of play.

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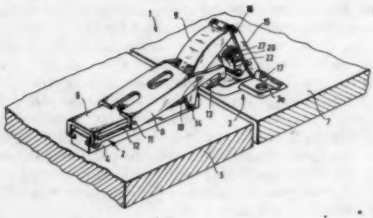
4,388,745

## SELF CLOSING MULTI PINTLE HINGE

Eberhard Schneider; Theodor Vitt, and Gerd Sturm, all of Cologne, Fed. Rep. of Germany, assignors to Prämeta Präzisionsmetall-und Kunststofferzeugnisse G. Baumann & Co., Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,977
Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918659
Int. Cl.³ E05D 3/06; F05F 1/12
U.S. Cl. 16—288 9 Claims



1. A wide-angle hinge assembly for use in a concealed arrangement for opening and closing a door leaf with respect to a frame, said assembly comprising:

(a) a frame hinge section and a door leaf hinge section connected to one another by a linkage arrangement,

(b) said linkage arrangement including two double-armed link members and a further link,

(c) said double-armed link members are pivotable in a scissor-like fashion with one another about a common pivot, and one of the link members pivotably engages one end of the further link which further link has its other end pivotally connected directly to the leaf hinge section,

(d) the linkage arrangement including a spring mechanism having a double-armed lever rotatable about a pivot and arranged on the further link,

(e) said lever including a cam follower, and

(f) a cam component disposed on the leaf hinge section to coact with the spring mechanism throughout the entire opening and closing of the door leaf to provide a pressure

during opening and closing and to further maintain the closed position for securing the door leaf.

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**4,388,746**

## BUCKLE FOR A SAFETY BELT

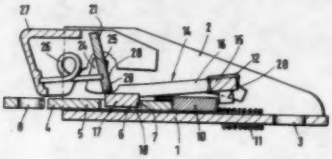
**Kurt Krautz, Rosengarten, and Erhard Ender, Hamburg, both of Fed. Rep. of Germany, assignors to Autoflug-Stakupress GmbH & Co., Nordestedt, Fed. Rep. of Germany**

**Filed Aug. 5, 1981, Ser. No. 290,371**

**Claims priority, application European Pat. Off., Nov. 18, 1980, 80107136.6**

**Int. Cl.³ A44B *19/00***

**U.S. Cl. 24—230 A** **9 Claims**



**1.** A buckle for a safety belt comprising a linear push-in tongue with a latching recess and a lock with a linear push-in path for the push-in tongue having an opening at a front end thereof for receiving the tongue and guide devices for guiding the tongue inwardly along the path, the lock having an ejector spring for urging the tongue outwardly along the path, a pivotal latch having a pivot axis which extends transversely to the direction of the linear push-in path and a latch nose pivotal into the push-in path to interact with the latching recess of the tongue to latch the tongue therein and so that in a pivotal latching position of the latch nose in which it latches the tongue within said path, the ejector spring urges the latch nose pivotally outwardly from the latching recess of the tongue, a pivotal securing device having a pivotal securing position for securing the pivotal latch in its pivotal latching position, and a spring with a spring force pivotally urging the securing device to its pivotal securing position, the securing device being pivotal from its securing position to allow the lock to open.

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**4,388,747**

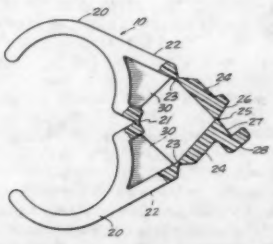
## ONE-PIECE MOLDED TOGGLE CLAMP

**Walter A. Plummer, 3546 Crown Ridge Dr., Sherman Oaks, Calif. 91403**

**Filed Aug. 10, 1981, Ser. No. 291,283**

**Int. Cl.³ A44B *21/00***

**U.S. Cl. 24—255 SL** **9 Claims**



**1.** A toggle clamp formed in one piece from plastic material suitable for use in forming a live hinge, said clamp comprising:

a pair of elongated jaws having one pair of ends lying in a bisector plane longitudinally of said clamp and interconnected by a single live hinge for pivotal movement of said jaws toward and away from one another; and

a pair of toggle members having a first pair of adjacent ends interconnected by a common live hinge and their remote ends connected to opposed ends of a respective one of said jaws by separate live hinges, said jaws being movable between a freely pivotable open position and immovable closed position as said toggle members are pivoted to shift said common live hinge from an open position remote from said single live hinge to a closed jaw-locking position between said single live hinge and a straight line through said hinges connecting said toggle members to said jaws.

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**4,388,748**

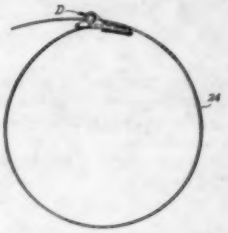
## BAND CLAMPING DEVICE

**Elmer E. Riedel, Cleveland, Ohio, assignor to The Triad Metal Products Company, Cleveland, Ohio**

**Filed Jun. 15, 1981, Ser. No. 273,902**

**Int. Cl.³ B65D *63/00*; F16L *33/14***

**U.S. Cl. 24—269** **2 Claims**



**1.** A band clamping device comprising; a frame including an elongated planar base and a pair of spaced parallel side walls extending upwardly from the sides of the base, a rotary winding shaft extending transversely across the frame and rotatably mounted in said side walls, said shaft having radially straight ratchet teeth disposed circumferentially around its circumference adjacent one end of the shaft interiorly of the spaced walls to form a ratchet wheel on said shaft, said elongated base having an extension at one end bent over upwardly partially upon itself with the free end of the bent over portion forming a resilient pawl operatively and resiliently engaging the teeth of said ratchet wheel for releasably holding the shaft from rotating, and a flexible clamping band for encircling an associated object to be clamped and secured at one end to the other end of the base, said shaft having a band insertion slot formed longitudinally in the shaft at the other end of the shaft and between said side walls for receiving the free end portion of the band therein, whereby a preselected length of the free end portion of the band may be inserted in said slot after which the shaft may be rotated to bend and lock the free end portion of the band in the device, said shaft being rotatable clockwise or counterclockwise to lock or unlock said free end portion of the band, the pawl being formed of only a portion of the free end of the bent over portion of the extension of the base to provide a resilient pawl enabling the shaft to be releasably held in selected positions of rotation in either direction.

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**4,388,749**

## U-BOLT PIPE CLAMP ASSEMBLY

**Frank Sassak, Riverview, Mich., assignor to McInerney Spring & Wire Company, Grand Rapids, Mich.**

**Filed Feb. 8, 1982, Ser. No. 346,734**

**Int. Cl.³ F16L *13/14***

**U.S. Cl. 24—277** **13 Claims**

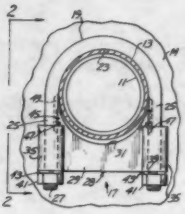
**1.** A clamp for securing together the annular overlap of a pair of telescoped engaging inner and outer pipes comprising of a U-bolt having a semi-circular bight portion terminating in a pair of spaced legs having threaded end portions;

a saddle plate assembly aligned with and including a saddle

plate opposed to said U-bolt and having a concave seat of semi-circular shape and having apertures to receive said legs;

a pair of upright keys on said saddle plate at the upper ends of said seat coplanar with and extending laterally outward thereof;

there being opposed spaced keyways formed in said U-bolt legs in lateral registry with said keys and outwardly thereof;



and fasteners threaded onto said end portions for operatively and compressively engaging said saddle plate assembly for tightly drawing together said U-bolt and saddle plate around said pipes in compression;

said keys guidably extending into said keyways respectively and interlocked therewith.

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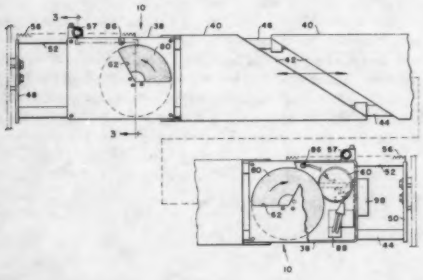
**4,388,750**

## WRINKLE REMOVER FOR A WEB OF RUNNING MATERIAL

**Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.**

**Filed Jan. 13, 1981, Ser. No. 224,753**
**Int. Cl.³ D06C** *3/06, 27/00*
**U.S. Cl. 26—75** **5 Claims**



1. A wrinkle remover for a web of running material comprising:

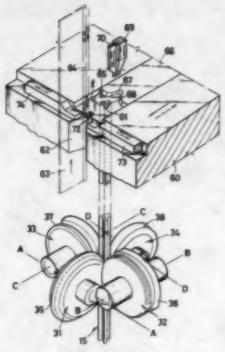
an elongated hollow member and a spreader box mounted on each end of said elongated hollow member, each of spreader boxes having an opening in the top thereof and a rotating brush mounted therein, means operably associated with each of said brushes urging said brushes towards said opening and means to rotate said brush mounted on said spreader box, each of said spreader boxes having a suction conduit operably associated therewith.

**4,388,751**

## METHOD AND APPARATUS FOR MANUFACTURING SLIDE FASTENER COUPLING ELEMENTS

**Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan**

**Filed Oct. 29, 1980, Ser. No. 201,695**
**Claims priority, application Japan, Oct. 29, 1979, 54-139706**
**Int. Cl.³ B21D** *53/52*
**U.S. Cl. 29—410** **3 Claims**



1. A method of manufacturing slide fastener coupling elements comprising the steps of:

(a) forming a blank rod having a substantially Y-shaped cross section including a pair of V-shaped diverging legs having thickened outer end portions and having at their midportions a pair of respective confronting projecting longitudinal ribs on opposite inner surfaces thereof;

(b) intermittently feeding said blank rod in a longitudinal direction;

(c) pressing each of said longitudinal ribs at portions thereof longitudinally spaced an interval from each other to thereby leave a succession of rib increments between said pressed, longitudinally spaced portions of the rib for subsequently serving as teeth;

(d) transversely slicing said blank rod substantially centrally across each rib increment on at least one of said legs into a plurality of individual slide fastener coupling elements; and

(e) forming a coupling head on each said coupling element.

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**4,388,752**

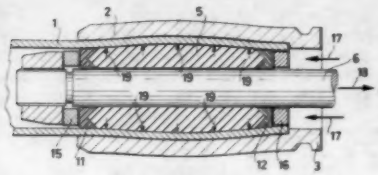
## METHOD FOR THE SEALTIGHT JOINTING OF A FLANGED SLEEVE TO A PIPELINE, ESPECIALLY FOR REPAIRING SUBSEA PIPELINES LAID ON VERY DEEP SEA BOTTOMS

**Costantino Vinciguerra, Florence, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of, Italy**

**Filed May 1, 1981, Ser. No. 259,380**
**Claims priority, application Italy, May 6, 1980, 21811 A/80**
**Int. Cl.³ B23P** *17/00*
**U.S. Cl. 29—421 R** **6 Claims**

1. A method for jointing in a sealtight manner a high tensile steel pipe to a cylindrical flanged sleeve having a constant cross-sectional area, said sleeve being mounted with a certain clearance onto the free end of said pipe and being made with a metallic material having a degree of elastic deformation greater than that of the pipe, characterized in that it comprises the sequential steps of inserting in the pipe-sleeve assembly a stiff rubber plug of annular cross-section idly mounted on a high tensile steel shaft and confined between two anti-extrusion Nylon rings also idly mounted on said shaft, in a circumferential V-shaped groove of the confronting front surfaces of

said rings the respective tapered lateral ends of said plug being inserted, axially compressing said stiff rubber plug, acting upon said Nylon rings to generate a radial expansion pressure, continuing said axial compression of said plug to expand the pipe-sleeve assembly radially until exceeding the yield point of the



pipe to plastically expand same and bringing the sleeve to its limit of elastic deformation, and finally releasing the pressure of the plug to allow the elastically deformed sleeve to contract onto said plastically expanded pipe to produce an interference fit therebetween and withdrawing said plug from the pipe.

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**4,388,753**

## METHOD OF LOADING RIVETS

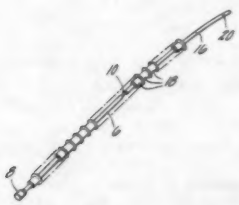
**David J. Brookes, Sutton Coldfield, England, assignor to USM Corporation, Farmington, Conn.**

**Filed Apr. 17, 1981, Ser. No. 255,316**

**Claims priority, application United Kingdom, May 3, 1980, 8014919**

**Int. Cl.³ B23P *19/04*; B21D *9/05***

**U.S. Cl. 29—433** **1 Claim**



1. The method of loading a column of hollow rivets onto a long-stemmed headed mandrel for use in blind-riveting wherein a column of rivets is provided assembled head-to-tail on a strand of resilient plastics material, comprising:

providing the mandrel with a reduced tail end portion with the remainder of the stem having a diameter substantially the same as that of the strand;

providing the strand with a hollow end portion at the end toward which the tail end of the rivet's face;

inserting the reduced tail end portion of the stem into the hollow end portion of the strand to securely grip the stem into the strand; and

sliding the rivet's tail first off the strand onto the stem of the mandrel.

**4,388,754**

## SKID PROTECTION DEVICE FOR WHEELS

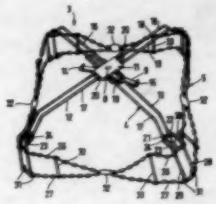
**Bengt E. Ilon, Pilatusstr. 16, Meggen-Luzern, Switzerland (6045)**

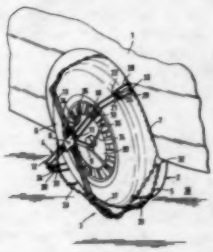
**Filed Oct. 29, 1981, Ser. No. 316,392**

**Claims priority, application Switzerland, Oct. 29, 1980, 8007589**

**Int. Cl.³ B23P *11/02*; B60C *27/14, 27/06***

**U.S. Cl. 29—446** **24 Claims**





21. A method of applying a skid protection device to a wheel having a tire mounted thereon, comprising:

positioning a resilient axial force applying device to the wheel;

arranging a skid protection device about a periphery of the tire except for a ground engaging portion of said periphery;

engaging a coupling member associated with said skid protection device with said resilient axial force applying means to hold said protection device against said wheel and about said tire and to apply an axial bias force to said coupling member whereby when said wheel rotates, said protection device automatically engages said ground engaging portion of said tire periphery.

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**4,388,755**

## STRUCTURE FOR AND METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY THE MASTER SLICE METHOD

**Hiromu Enomoto, Kawasaki; Yasushi Yasuda, Inagi; Yoshiharu Mitono, Tokyo; Taketo Imaizumi, Fukuoka, and Hitoshi Ohmichi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 17, 1980, Ser. No. 207,737**

**Claims priority, application Japan, Nov. 20, 1979, 54-150307**

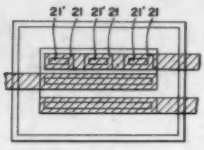
**Int. Cl.³ H01L *27/04***

**U.S. Cl. 29—577 C** **5 Claims**

1. A master slice method for forming semiconductor devices of selectively different kinds, each such device comprising a predetermined plurality of bipolar transistors respectively having common, predetermined DC characteristics and substantially similar, desired values of emitter current densities, comprising:

providing a semiconductor substrate of predetermined area for each such semiconductor device,

employing a common master pattern to form said predetermined plurality of bipolar transistors in a predetermined portion of said area of said semiconductor substrate provided for each said semiconductor device, including forming for each said bipolar transistor in accordance with said common master pattern, a collector region, a base region,




and a predetermined plurality of emitter regions formed in said base region, and

the DC characteristics of a given such semiconductor device being determined in accordance with the number of emitter regions, out of said predetermined plurality thereof, selectively connected together to form, collectively, the active emitter region of each such bipolar transistor of each said semiconductor device.

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**4,388,756**

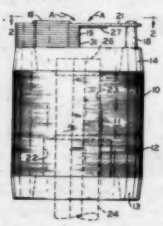
## METHODS OF MAKING IMPROVED ROTOR ASSEMBLY

**Richard D. Burns, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 954,663, Oct. 25, 1978, Pat. No. 4,271,368. This application Nov. 25, 1980, Ser. No. 210,309**

**Int. Cl.³ H02K *15/14***

**U.S. Cl. 29—598** **3 Claims**



1. A method of manufacturing a rotor assembly comprising a laminated rotor body having a centrally locating bore, electrically conductive members, balance weights, and a shroud overlying the balance weights and the bore, said method comprising the steps of: fabricating a shroud by locating a central knockout plug, separating the central knockout plug from the remainder of the shroud around a major portion of the perimeter of the knockout plug and defining fracture lines along at least two tabs that interconnect the knockout plug with the remainder of the shroud, assembling at least one counterweight with the rotor body; positioning the shroud over the at least one counterweight; interconnecting the parts so assembled by fastening the shroud, at least one counterweight, and remainder of the rotor assembly with attaching means while the knockout plug is positioned in substantially collinear relationship with the bore of the rotor; mounting the rotor assembly on a shaft, and subsequently separating the knockout plug from the shroud by severing said tabs, thereby providing a hole for access to the shaft; utilizing such hole for access while pressing the rotor assembly and shaft apart by engaging an end of the shaft through such hole; and subsequently replacing said knockout plug in such hole.

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**4,388,757**

## METHOD FOR MANUFACTURING ELECTRIC SWITCHING BLOCK OF ELECTROMAGNETIC RELAY

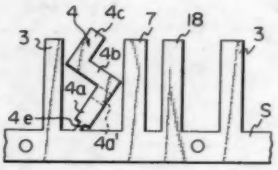
**Hidetoshi Takeyama, Hisai; Siro Sakamoto; Koji Sagawa, both of Tsu; Tokio Tanishi, Mie; Hiroaki Aihoshi, Tsu, and Takao Morimoto, Mie, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany, a part interest**

**Filed Dec. 24, 1980, Ser. No. 219,836**

**Claims priority, application Japan, Jul. 31, 1980, 55-106240**

**Int. Cl.³ H01H *11/04***

**U.S. Cl. 29—882** **1 Claim**




1. A method of manufacturing a switching block of an electromagnetic relay of the type comprising:

an insulative base,

a plurality of switching sections carried by said base, each switching section including

a pair of fixed contact terminals embedded in said base,

a resiliently movable contactor having a movable contactor terminal embedded in said base, and

a coil terminal embedded in said base, and

an electromagnetic block having a movable armature disposed between said switching sections to move said resiliently movable contactors,

said method comprising the steps of:

(1) forming two contact parts, wherein each contact part comprises an elongate metal strip carrying said pair of fixed contact terminals, said movable contactor terminal, and said coil terminal; one of said fixed contact terminals being of zig-zag shape and inclined away from the other fixed contact terminal;

(2) arranging said two contact parts in parallel relationship;

(3) bending an intermediate portion of said zig-zag shaped fixed contact terminal so that said intermediate portion lies perpendicular with respect to the plane of said strip, the length of said intermediate portion corresponding to a predetermined distance between said pair of fixed contact terminals,

(4) straightening said zig-zag shaped fixed contact terminal by moving the latter toward the other fixed contact terminal such that an end of said zig-zag shaped terminal lies opposite an end of said other fixed contact terminal,

(5) molding said insulative base in a manner embedding at least two of said contact parts therein, such that said fixed contact terminals, said movable contact terminal, and said coil terminal of each contact part are embedded in said base intermediate their ends; and

(6) separating said strips from the remainder of said contact parts.

4,388,758

## DIGITAL ELECTRICAL ANGLE-MEASURING DEVICE

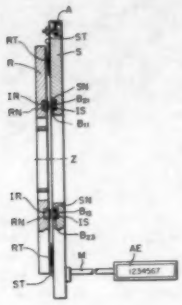
Alfons Ernst, and Hans-Rudolf Kober, both of Traunreut, Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,471

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008396

Int. Cl.³ G01B 7/30

U.S. Cl. 33—1 PT 11 Claims




2. In an inductive angle measuring device comprising a stator having an electrically conductive division conductor mounted on a conductor side thereof, a rotor having an electrically conductive scanning conductor mounted on a conductor side thereof, wherein the rotor is mounted to rotate with respect to the stator about an axis and the division conductor is positioned adjacent to and separated by a gap from the scanning conductor, the improvement comprising:

a plurality of circumferentially spaced contact springs differing in length, one to another, mounted on the conductor side of the rotor and electrically connected with the scanning conductor; and

a pair of annular slip rings mounted on the conductor side of the stator, concentric with the axis opposite the contact springs such that at least one of the contact springs is in electrical contact with each of the slip rings, said slip rings being electrically connected with the evaluating circuit;

said contact springs and slip rings cooperating to transmit measuring signals developed in the scanning conductor from the rotor to the evaluating circuit.

3. In an electrical digital angle measuring device comprising a first component and a second component, each of said first and said second components defining a conductor side, wherein one of the two components is a stator having an electrically conductive measuring division conductor mounted on the conductor side thereof, and the other of the two components is a rotor having an electrically conductive scanning conductor mounted on the conductor side thereof, and wherein the rotor is mounted to move relative to the stator and the division conductor is positioned adjacent to and separated by a gap from the scanning conductor, the improvement comprising:

at least one electrically conductive contact strip mounted on the conductor side of the first component; and

a plurality of circumferentially spaced electrically conductive contact members mounted on the conductor side of the second component such that each contact member is in electrical contact with the contact strip, each of said plurality of contact members comprising a contact spring which is spring biased toward the contact strip.

4,388,759

## ELECTROCARDIOGRAM CALIPER

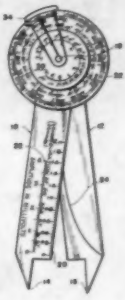
Wilmo C. Orejola, 1630 Phippine Heart Center for Asia, Quezon City, Metro Manila, Philippines

Filed Aug. 24, 1981, Ser. No. 295,603

Claims priority, application Philippines, Oct. 15, 1980, UM-4323

Int. Cl.³ G01B 5/02

U.S. Cl. 33—1 C 2 Claims



1. A caliper for aiding in the rapid determination of deflection amplitudes, intervals and frequencies from standard electrocardiogram tracings, said caliper comprising:

first and second caliper arms, each arm pointed at its first end and coupled together for rotation about a pivot pin at the second end, each of said arms having a wide, blade-shaped construction;

a first calibration on the first surface of said first arm, said first calibration being a linear representation of seconds of duration of a tracing deflection;

a second calibration on the first surface of said first arm, said second calibration being a linear representation of millivolt amplitude of a tracing deflection;

a first curved index line on the second surface of said second arm, said first and second calibrations being read at the intersection of the inner edge of said first arm and said first curved index line;

a third calibration on the first surface of said second arm, said third calibration representing frequency as measured between successive similar deflections and between three such similar deflections; and

a second curved index line on the second surface of said first arm, said third calibration being read at the intersection of the inner edge of said second arm and said second curved index line.

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4,388,760

## MARKING DEVICE

Robert M. Aspy, Stanhope, N.J., assignor to Congoleum Corporation, Kearny, N.J.

Filed Dec. 3, 1981, Ser. No. 326,970

Int. Cl.³ B43L 13/02

U.S. Cl. 33—42 3 Claims

1. A wall edge marking device for marking a line along resilient floor covering for subsequent cutting comprising in combination:

a flat, horizontally planar, relatively smooth base surface capable of sliding along the surface of a resilient floor covering laid flat out on a floor;

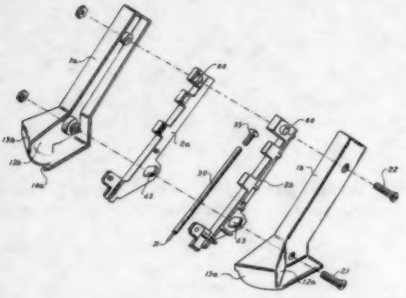
a pair of flat vertically planar, relatively smooth front faces each in planes substantially perpendicular to said flat horizontally planar relatively smooth base surface each of the faces of said pair in angular relation to the other, forming at their intersection a vertical edge, said vertical edge capable of sliding along the surface of a portion of

said resilient floor covering which is curled upwardly partly along the lower most portion of a wall abutting said floor;

said flat horizontally planar, relatively smooth base surface, and said flat vertically planar relatively smooth pair of front faces, possessing sufficient flat planar surfaces whereby said wall edge marker is capable of steady, stable, non-rocking, sliding motion along the surface of said resilient floor covering;

a relatively smooth arcuate surface in the form of a quarter cylinder connecting said flat horizontally planar, relatively smooth base surface and said pair of flat vertically planar relatively smooth front faces;

an axial marking instrument having a marking point intersecting said arcuate surface and extending from within said wall edge device to appoint beyond said arcuate surface;



a first means for adjusting the point of intersection of said marker and said arcuate surface, along said arcuate surface;

a second means for adjusting the extension of said marking instrument through said arcuate surface along the major axis of said marking instrument;

said first and second means constructed and arranged so that the straight line distance from the intersection of said arcuate surface and said flat, horizontally planar relatively smooth base surface to said lower most portion of the wall is equal to the arc distance from the intersection of said flat horizontally planar, relatively smooth base surface and said arcuate surface, to said intersection of said marking instrument and said arcuate surface, as measured along said arcuate surface; said straightline distance and said arcuate distance being equal in length to the radius of said quarter cylinder.

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**4,388,761**

**SCRIBER**

**Clifford W. Henderson, 3945 Bradford St. (Space 103), La Verne, Calif. 91750**

**Continuation of Ser. No. 170,883, Jul. 21, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,378**

**Int. Cl.³ B43I *13/02***

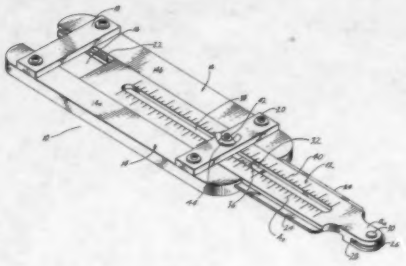
**U.S. Cl. 33—42** **6 Claims**

1. A scribing device comprising:

first and second members;

means receiving the members in sliding relationship for movement of one member relative to the other member along a common axis;

a single roller rotatably mounted on one end of the first member, the second member having both a scribe orifice and an elongated slot therethrough, the slot extending along the common axis, wherein the first member slidably engages the elongated slot and the scribe orifice is aligned with the elongated slot, and wherein the first member has an elongated slot therethrough extending along the common axis for providing that a scribe can be inserted through said elongated slot in the first member and then through the scribe orifice, the scribe orifice being sufficiently large to allow the tip of a pencil to extend therethrough, yet being small enough to hold the pencil tip relatively firmly in engagement therein, the roller and scribe orifice being about on a line along the common axis;



means for locking the two members together when the members are adjusted to provide a selected distance between the roller and scribe orifice; and

graduations on one of the members for indicating the distance from the roller to the scribe orifice along the common axis.

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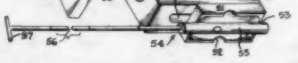
**4,388,762**

**CHAIN SAW MEASURING DEVICE**

**John H. Debell, Jr., Carpenter Hill Rd., and David J. Allen, Vail Road Ext., both of Bennington, Vt. 05201**

**Int. Cl.³ B27G *23/00***

**U.S. Cl. 33—185 R** **13 Claims**



1. A measuring device for use with chain saws and adapted to cooperate with one or more threaded chain bar mounting studs on the chain saw housing, comprising;

at least one elongated adaptor element having a threaded aperture on one end dimensioned to cooperate with a threaded chain bar mounting stud,

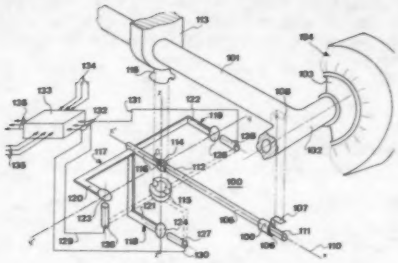
a mounting bracket, comprising an apertured L-shaped bracket member operatively connected to said at least one adapter element, and

a measuring apparatus rotatably mounted on said L-shaped bracket member, and adapted to be shifted along a portion of said bracket, to position its axis of rotation in the same plane as the blade on the chain saw.

## 4,388,763
## DEVICE FOR THE DETECTION OF THE DISPLACEMENT OF AT LEAST ONE POINT RELATIVE TO A REFERENTIAL, AND APPLICATION OF THE DETECTION OF THE UNDERINFLATED STATE OF TIRES AND/OR OF MASS AND CENTERING FOR AERODYNES

Jean Masclet, Paris, and Jacques Veaux, Chatillon, both of France, assignors to Messier-Hispano-Bugatti, Mongrouge, France

Filed Feb. 17, 1981, Ser. No. 234,875
Claims priority, application France, Feb. 20, 1980, 80 03701; Jun. 12, 1980, 80 13050
Int. Cl.³ G01B 5/24
U.S. Cl. 33—203.18 20 Claims



13. The device for detecting the displacement of an element relative to a referential comprising:

a recopying bar;

means connecting a first end of said bar with an element, the other end of said bar being capable of cooperating with means determining the displacement of said second end relative to said referential;

said means determining the displacement of said second end comprising at least one pickup having at least two active parts, one of said parts being situated on said recopying bar, and the other of said parts being fixed relative to said referential;

a second pickup, said two pickups being situated on two first, unmerged axes (oy,oz') converging to a point (0), said point (0) belongs to said recopying bar;

means for holding said recopying bar in such a way that said point (0) will be substantially fixed relative to said referential;

said means holding said recopying bar including a swivel surrounding said recopying bar, said swivel being fixed to said referential; and

a third pickup situated on a third axis (oy') not merged with the said two first axes (oy,oz'), but converging on the same said point (0).

18. The device according to claim 13, wherein said two pickups are situated substantially in the said plane.

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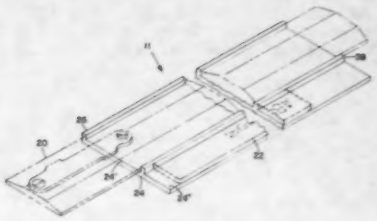
## 4,388,764
## TEMPLATE GUIDE

Glenn P. Hermes, 295 E. River, New Braunfels, Tex. 78130

Filed Dec. 7, 1981, Ser. No. 328,013
Int. Cl.³ B43L 13/00
U.S. Cl. 33—403 6 Claims

1. A template guide in combination with a drafting arm of a parallel motion protractor comprising:

a substantially flat elongated base member having a longitudinal ridge extending substantially parallel to the edges of said base member and projecting normal to one surface of said base member, said ridge dividing said base member into first and second portions, said first portion being of a size sufficient to cradle a drafting template and allow said drafting template to be moved longitudinally along said ridge parallel to said drafting arm of said parallel motion protractor, said second portion being of a size sufficient to cradle said drafting arm of said parallel motion protractor



such that said ridge extends parallel to the edge of said drafting arm; and

means for releasably securing said base member to said drafting arm such that said ridge is maintained parallel to the edge of said drafting arm.

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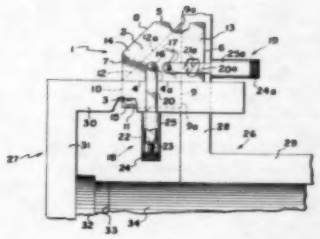
## 4,388,765
## PIPEFITTERS SQUARE HOLDER

Timothy C. Dearman, P.O. Box 937, Pearland, Tex. 77581

Filed Oct. 21, 1981, Ser. No. 313,297
Int. Cl.³ B43L 7/06
U.S. Cl. 33—464 14 Claims



1. A holder for use with a welder's square or the like, said holder comprising a substantially flat body having a number of angularly spaced, linear side edges; means forming an abutment inwardly of each of said edges, that portion of said body extending between an abutment and the associated side edge constituting a ledge; support means carried by said body for angular movements between a first position in which it overlies one of said ledges to a second position in which it overlies another of said ledges; and clamp means carried by said support means and operable to clamp said square against an abutment when said support means is in either selected one of said positions.

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## 4,388,766
## HUMIDITY-CONTROLLED DIVERTER VALVE

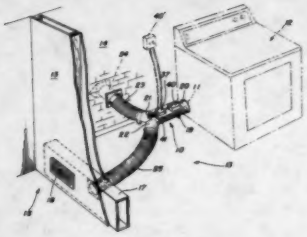
L. Wayne Sanderson, 5407 Knob Rd., Nashville, Tenn. 37209

Filed Aug. 17, 1981, Ser. No. 293,495
Int. Cl.³ F26B 11/04
U.S. Cl. 34—54 7 Claims

1. A fluid flow control device for an automatic clothes dryer having an exhaust air outlet within an enclosure, a space within said enclosure, and a space outside said enclosure, comprising:

(a) a fluid conduit having an inlet and first and second outlets,

(b) said inlet being in fluid communication with the exhaust air outlet of the automatic clothes dryer,
(c) said first outlet being in fluid communication with the space outside the enclosure,
(d) said second outlet being in fluid communication with the space within the enclosure,
(e) valve means in said fluid conduit having a first operational mode opening fluid passage between said inlet and said first outlet and closing fluid passage between said inlet



and said second outlet, and a second operational mode opening fluid passage between said inlet and said second outlet and closing passage between said inlet and said first outlet, and
(f) humidity sensitive control means operatively connected to said valve means for positioning said valve means in said first operational mode or said second operational mode in response to predetermined values of humidity sensed by said control means.

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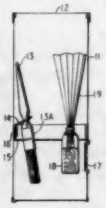
**4,388,767**

## PROCESS AND APPARATUS FOR STORING PAINT BRUSHES AND THE LIKE

**Gordon F. Dison, "Crae", Royleen Dr., Frodsham, Cheshire, and Henry B. Dison, 16, Crescent Dr., Helsby, Cheshire, both of England**

**Filed Mar. 16, 1981, Ser. No. 243,700**
**Int. Cl.³ B08B *5/00***
**U.S. Cl. 34—78** **6 Claims**



1. An apparatus for the at least substantial prevention of hardening of paint brushes and related items for paints, varnishes, sealers, coatings, and the like that harden by an oxidation/polymerization mechanism, comprising
a housing for said paint brushes and related items,
means for suspending one or more of said brushes and related items or paint applying portions thereof within said housing,
a cover for said housing, and
means providing one or more antioxidants in said housing to provide a vapor system that at least substantially prevents the stated hardening of the paint by an oxidation/polymerization mechanism on said paint brushes and related items, or paint applying portions thereof when suspended within said housing.

**4,388,768**

## STIFFENING AND NON-SLIP MATERIAL FOR THE HEEL REGION OF SHOES

**Olaf Möbius, Rodenbach, Fed. Rep. of Germany, assignor to Degussa AG, Frankfurt, Fed. Rep. of Germany**

**Division of Ser. No. 52,306, Jun. 26, 1979, Pat. No. 4,308,763.**
**This application Apr. 3, 1981, Ser. No. 250,722**
**Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828509; Jun. 29, 1978, 7819462[U]**
**Int. Cl.³ A43B *13/42*; A43D *21/00***
**U.S. Cl. 36—68** **50 Claims**

1. Stiffing and non-slip shoe inner material suitable for the heel region of a shoe which material is thermoplastic or moldable through the action of solvent and in the form of continuous sheets or blanks, said material comprising a single fiber structure loaded with at least one synthetic resin acting as a stiffening agent at a temperature up to 60° C. in an amount of 0.1 to 0.9 kg per square meter of fiber structure and wherein at least one surface of the shoe inner material is slip or skid preventive.

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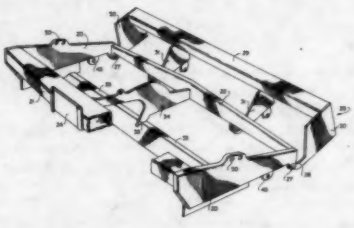
**4,388,769**

## EARTH MOVING SCRAPER

**Richard B. Miskin, P.O. Box 218, Ucon, Id. 83454**

**Filed Oct. 1, 1981, Ser. No. 307,431**
**Int. Cl.³ E02F *5/00***
**U.S. Cl. 37—126 AC** **9 Claims**



1. In an earth moving, ground leveling and land planing machine having a frame supported by at least two ground engaging wheels at the back end of the frame; a cutting blade disposed laterally between the opposite, longitudinal sides of said frame and adjacent to the bottom of said frame, with the blade positioned so that at least the forward cutting edge thereof is disposed below the bottom of said frame; a bucket having a floor and upstanding back and side walls, said bucket being disposed with the forward edge of said floor thereof adjacent to the trailing edge of said blade, an improvement in said machine comprising:
said cutting blade having a cutting width of at least about 10 feet;
a blade support member extending from the back end of said frame to the forward end thereof substantially along the longitudinal center of said frame, with said blade support member having a downwardly extending portion which is integrally attached as by welding to said blade substantially intermediate the cutting width of said blade.

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**4,388,770**

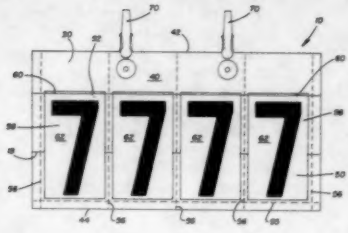
## IDENTIFICATION BADGE

**Sissy J. Manor, 10113 Goshen Rd., Fort Wayne, Ind. 46802**

**Continuation-in-part of Ser. No. 295,725, Aug. 20, 1981, abandoned. This application Sep. 30, 1981, Ser. No. 307,004**
**Int. Cl.³ A44C *3/00***
**U.S. Cl. 40—1.6** **12 Claims**

1. An identification badge for detachable attachment to a wearer comprising:
a generally planar member having opposite surfaces, one of said surfaces faces outwardly from the wearer;

a means, secured to said member, for detachably attaching the badge to the wearer;
a transparent pocket formed in said outwardly facing surface;
an identification member removably positionable within said pocket so as to indicate the identity of the wearer;
the other of said surfaces faces inwardly toward the wearer;



another transparent pocket formed in said inwardly facing surface; and
a second identification member positioned within said another pocket so that one identity is indicated by said outwardly facing surface and another identity is indicated by said inwardly facing surface.

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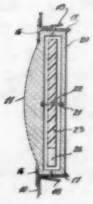
**4,388,771**

## HUB CAP DISPLAY DEVICE

**Louis A. Lalonde, 3470 Stanley, Apt. 902, Montreal, Quebec, Canada**

**Filed Apr. 14, 1980, Ser. No. 140,145**
**Int. Cl.³ G09F *21/04, 11/02;* B60B *7/00***
**U.S. Cl. 40—587** **1 Claim**



1. A display device for a hub cap of a vehicle wheel comprising:
a water-proof, permanently and imperviously sealed housing having a circular front wall, a circular back wall, and a peripheral wall joining the front and back walls together, at least the front wall being transparent, and the inner surface of the front wall being parallel to the inner surface of the back wall; means for mounting the sealed housing on a hub cap with the front wall directed outward; a circular disc within the housing, the disc having a front surface and a rear surface, and a design or the like on its front surface visible through the front wall of the housing; means for rotatably mounting the disc within the housing with its front surface parallel to the front wall of the housing and its rear surface parallel to the rear wall of the housing, the mounting means comprising a mounting depression in the center of both the front and rear walls of the housing, the depression in each wall extending inwardly into the wall, but not through, from the inner surface of the wall, and an axle fixed to the center of the disc and projecting into each depression whereby the disc is freely, rotatably mounted between the housing walls in a manner which prevents leakage into the sealed housing; and a weight in a peripheral portion of the disc between its front and rear surfaces to rotate the disc to a constant attitude when the hub cap stops rotating.

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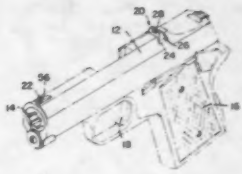
**4,388,772**

## ADJUSTABLE SIGHT FOR FIREARMS

**Michel E. Maes, Bellevue, Wash., assignor to Detonics Pistol Accessories, Ltd., Seattle, Wash.**

**Filed Jan. 12, 1981, Ser. No. 224,318**
**Int. Cl.³ F41G *1/10***
**U.S. Cl. 42—1 S** **5 Claims**



1. An adjustable sight for firearms, comprising:
a base having a slot extending transversely across an upper rear surface of said firearm; and
a sight blade releasably mounted in said slot, said blade having a notch extending downwardly at the approximate midpoint of said blade to allow said firearm to be aimed by aligning said notch with a sight bead projecting upwardly from an upper front surface of said firearm whereby the sighting characteristics of said firearm may be altered by substituting sight blades having varying heights, said sight further including a threaded bore formed in said base extending downwardly from an upper surface thereof to intersect said slot at an acute angle, an aperture formed in said blade at the point of intersection between said bore and said slot, and a blade set screw threaded into said bore, said set screw having an end which is sufficiently pointed that the lower surface of said point contacts the lower edge of said aperture, thereby urging the lower surface of said blade against the bottom of said slot.

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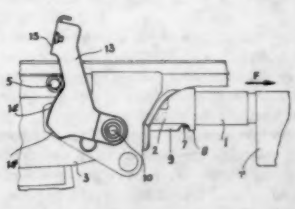
**4,388,773**

## LEVER-TYPE CLOSING DEVICE FOR BLOCKING AND UNBLOCKING THE BARREL OF AUTOMATIC, PORTABLE FIREARMS

**Pier C. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi Pietro Beretta S.p.A., Italy**

**Filed Feb. 2, 1981, Ser. No. 230,435**
**Claims priority, application Italy, Mar. 7, 1980, 5129-A/80**
**Int. Cl.³ F41C *21/22***
**U.S. Cl. 42—75 B** **4 Claims**



1. A lever-type closing device for the blocking and unblocking of the barrel of an automatic, portable weapon having a carriage with a holding handle protruding from a side of the weapon, said closing device comprising a blocking pin which rotates about its own axis and which has a semi-cylindrical portion defined by a notch, a maneuver lever mounted for

rotation on said pin, said pin being mounted transversely on the frame of the weapon so as to engage a semi-cylindrical seat provided at the base of the breech of the barrel for blocking and unblocking the barrel, said maneuver lever being on a side of the weapon forward of said handle of said carriage, characterized in that said maneuver lever has a cam portion which acts against said handle to maintain said carriage in a relatively rearward position when said lever is in the unblocking position of the barrel, said cam portion having a curved section that is concentric with the axis of said pin so that movement of said handle on said curved section does not cause rotation of said lever, said cam portion further including a flat section which, when subjected to a force applied thereto by said handle, tends to move said lever to a position blocking said barrel.

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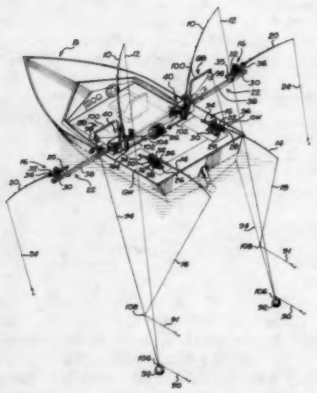
**4,388,774**

## FISHING SYSTEM

**Dale W. Thoemke, P.O. Box 703, Buckley, Wash. 98321**

**Filed Jan. 23, 1981, Ser. No. 227,750**
**Int. Cl.³ A01K *97/10*; B63B *35/14***
**U.S. Cl. 43—21.2** **15 Claims**



**12.** A retractable fishing pole support apparatus for supporting a fishing pole within a holder to position a fishing line laterally outwardly from the side of a boat a distance greater than the length of the fishing pole, said support apparatus comprising:

a rigid, elongate boom disposed generally transversely to the length of the boat, said boom having an inner end portion and an outer end portion on which the fishing pole holder is mounted, said boom being of a length approximating the beam width of the boat;

an antifriction support assembly fixedly mounted adjacent the gunwale of the boat and supporting said boom for rectilinear travel outwardly from one side of the boat and for retractional travel toward the opposite side of the boat;

handle/stop means mounted on the inner end portion of said boom for manually extending and retracting said boom and for limiting the extensional travel of said boom, and

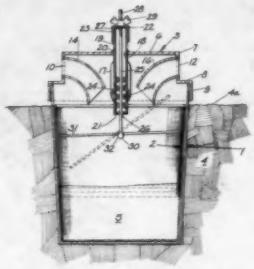
a fishing pole arranged with the handle thereof in said fishing pole holder and extending outwardly of the boom beyond the outer end of the boom.

**4,388,775**

## TRAP FOR SMALL ANIMALS

**Newton E. Wright, R.R. 3, Box 508, Abingdon, Va. 24266**

**Continuation-in-part of Ser. No. 108,718, Dec. 31, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,200**
**Int. Cl.³ A01M *23/04***
**U.S. Cl. 43—69** **14 Claims**



**11.** A trap for small animals such as rodents and the like comprising a vessel having an open upper end and a removable cover closing said open upper end of said vessel, said cover having a peripheral downwardly depending skirt engaging said open upper end of said vessel about its periphery, said cover having at least one opening therein, a rigid one piece rod-like support attached to said cover and extending vertically downwardly thereof and axially of said vessel, a universally tiltable platform, said platform having a central perforation, said rod-like support extending through said platform perforation with clearance, said rod-like support having an enlarged lower end below said platform configured to normally support said platform in a horizontal position and to permit universal tilting of said platform.

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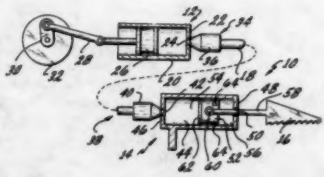
**4,388,776**

## PNEUMATICALLY OPERATED TOY EMPLOYING A MOVABLE IMPLEMENT

**Gorden W. Spring, Norwalk, Calif., assignor to Tomy Corporation, Carson, Calif.**

**Continuation-in-part of Ser. No. 159,774, Jun. 16, 1980, abandoned. This application May 5, 1981, Ser. No. 260,692**
**Int. Cl.³ A63H *29/16***
**U.S. Cl. 46—44** **9 Claims**



**1.** A toy of the type including a fluid compressor means in which an improvement comprises:

said fluid compressor means including a first connecting port serving as a fluid passageway between the exterior of said fluid compressor means and the interior of said fluid compressor means, said fluid compressor means being constructed so as to provide a cycling positive and negative fluid pressure at said port;

a motor means operatively associated with said fluid compressor means and capable of causing movement of at least a portion of said fluid compressor means, said fluid com-

pressor means providing said cycling positive and negative fluid pressure in response to said movement;

a flexible fluid line including coupling means located at its respective ends;

one of said coupling means at one of said ends of said line attaching to said first port so as to connect the interior of said fluid line to said fluid compressor means and provide cycling positive and negative fluid pressure at the other of said ends of said line;

an output chamber including a second port, said second port serving as a fluid passageway between the exterior of said chamber and the interior of said chamber, the other of said coupling means connecting the other of said ends of said line to said second port and providing cycling positive and negative fluid pressure at said second port in response to said cycling pressure at said first port;

a piston movably connected to said chamber and means for moving said piston with respect to said chamber in response to fluid pressure within said chamber;

an implement operatively connected to said piston and movable in response to movement of said piston with respect to said chamber;

bypass means associated with said chamber and responsive to at least said negative pressure at said second port so as to allow fluid passage through at least a portion of said chamber without movement of said piston with respect to said chamber.

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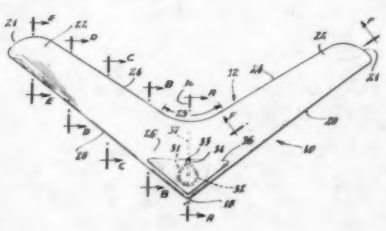
**4,388,777**

## TOY SAILPLANE

**Carl Z. Hermann, Sugar Hill Rd., Falls Village, Conn. 06031, and Timothy L. Locke, Lower River Rd., West Cornwall, Conn. 06796**

**Filed Aug. 25, 1981, Ser. No. 296,159**
**Int. Cl.³ A63H *27/00***
**U.S. Cl. 46—79** **25 Claims**



1. A toy sailplane comprising:

a single piece sweptback wing being substantially symmetrical about a central plane and having a central nose, said wing having two leading edges extending in an angular relation with respect to each other from said central nose and having a tip portion located at the respective end of each said leading edge, said wing including a trailing edge extending between said tip portions, said wing including generally continuous smooth upper and lower surfaces extending between each said leading edge and said trailing edge, said upper surface being convex in cross-sections parallel to said central plane, said lower surface being concave in cross-sections parallel to said central plane with mean chords of the wing taken at cross-sections parallel to and progressing outwardly from said central plane having average slopes that gradually increase to define upwardly directed wing tip portions, said upper surface further being concave and said lower surface further being convex in respective cross-sections generally parallel to said leading edges in the regions of said tip portions, and

means for weighting said wing suspended from the wing and located on said central plane.

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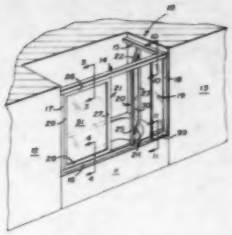
**4,388,778**

## ENCLOSURE FOR BATHTUB OR SHOWER HAVING SLIDING DOORS

**Michael E. Brooke, Sharon, Wis., assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Mar. 16, 1981, Ser. No. 244,399**
**Int. Cl.³ E05D *15/26***
**U.S. Cl. 49—125** **7 Claims**



1. A sliding door assembly for a bathtub or shower enclosure, comprising a first support member, a second support member and a pair of sliding doors slidably supported by said support members, said first support member being arranged to support said doors at the front of said enclosure, and said second support member being arranged perpendicular to said first support member and arranged to support said doors at the side of said enclosure in storage position,

each of said support members comprising a frame having a pair of longitudinally arranged spaced-apart tracks,

each of said tracks comprising a pair of spaced-apart depending flanges having flat lips at their lower edges, the lips of each pair of flanges being directed toward each other and substantially perpendicular to said depending flanges, said depending flanges and said lips cooperating to define a track channel and a constricted slot, the track channels and constricted slots of each track of said first support member communicating with corresponding track channels and constricted slots of said second support member,

each of said doors having a pair of spaced-apart supporting means mounted at the upper edge thereof,

each of said supporting means comprising an elongate member affixed at one end to the upper edge of said door, and having a cylindrical glide member of circular cross-section affixed to the other end thereof, said glide members being slidably disposed within said track channel and supported by the lips of said track and arranged to support said doors, said elongate means extending through said constricted slot, said glide members being slidable within said track channels and being transferable from the track channels of said first supporting member to the track channels of said second supporting member, whereby said doors may be moved for opening and closing said enclosure opening when engaged in the tracks of said first supporting member, and may be transferred to the tracks of said second supporting member for storage.

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**4,388,779**

## EASY-TO-OPEN, PRESSURE-RESISTANT DOOR ASSEMBLY

**Carl R. Peterson, Elm St., Boxford, Mass. 01921**

**Filed Feb. 9, 1981, Ser. No. 232,639**
**Int. Cl.³ E05D *15/28***
**U.S. Cl. 49—253** **12 Claims**

1. An easy-to-open, pressure-resistant door assembly for an access opening of predetermined shape in a wall,

said wall disposed between high and low air pressure regions in a mine or the like, with the door located on the high pressure side of the opening and air pressure drop across the door serving to keep the door sealed,

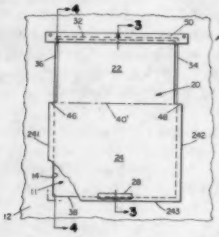
said door having a first edge corresponding to a first edge of said access opening and a door pivot axis spaced from said first door edge a substantial distance in the direction of the opposite second edge of said door,

the first part of said door that extends between said first door edge and said door pivot axis having a width slightly narrower than the corresponding part of said predetermined access opening to enable pivotal movement of said first part of said door about said door pivot axis inwardly of said access opening toward the low pressure region while the second part of said door, on the opposite side of said door pivot axis, pivots outwardly toward the high pressure region,

a pivot link means pivotally supporting said door in the region of said door pivot axis and extending to a link pivot axis parallel to the door pivot axis and located in the region of said first edge of said access opening,

a limit means adapted to limit the pivotal movement of said door about said door pivot axis to an acute angle,

and said pivot link means arranged to swing said door pivot axis and the door supported thereby outwardly about said link pivot axis to move said door pivot axis in the direction toward a line projected perpendicular to said wall from said link pivot axis,



and stop means adapted to prevent the part of said door adjacent said second edge from moving inwardly through said opening,

whereby, upon application of operator force for opening said door, as by pushing or pulling by one hand of the operator, said door can respond in successive first and second phases of opening motion,

in said first phase of opening motion said door responding by pivoting through an acute angle about said door pivot access, the exposure of the door to high air pressure resisting bodily rotation of said door and link means about said link pivot axis, while distribution of the pressure on opposite sides of said door pivot axis enables said first phase of motion about said door pivot axis to occur with relatively small operator force,

said first phase of motion enabling substantial equilibration of air pressure on both sides of said door in the region of said access opening,

and in said subsequent second phase of opening motion said link means enabling bodily swinging of said door and link means about said link pivot axis after said equilibration of air pressure to complete the movement of said door relatively easily to its open position to permit unobstructed access through said opening.

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**4,388,780**

## ELECTRIC POWERED WET STONE

**Spencer C. Rees, Sugar Grove, Ill., assignor to Wen Products, Inc., Chicago, Ill.**

**Filed Dec. 31, 1980, Ser. No. 221,558**
**Int. Cl.³ B24B *3/36***
**U.S. Cl. 51—128** **20 Claims**

**1.** An electric grinding machine comprising:

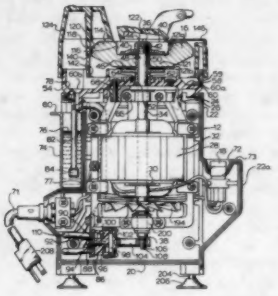
a housing enclosing an electric motor having a vertically disposed rotatable shaft extending through and above a top wall of said housing,

an annular grinding wheel removably mounted at an upper end of said shaft to be corotatable with said shaft about a vertical axis,

said grinding wheel having a flat upper surface positioned above said top wall of said housing and having a bevel at the outer circumference of said upper surface whereby an outer circumference of said wheel is greater below said bevel than at said upper surface,

a guard having vertical side walls removably mounted to said housing, above said housing and enclosing said grinding wheel,

said guard being vertically adjustable and having a low limit position where a portion of the guard is in contact with said upper surface of said grinding wheel,



said guard having at least one opening therein defining an upper edge of said side walls for providing access to said flat upper surface of said grinding wheel,

said outer circumference of said wheel, below said bevel, remaining below said upper edge of said side walls and not horizontally exposed through said guard opening when said guard is in said low position,

a receptacle for storing water carried within said housing,

a pump driven by said motor for moving said water from said receptacle and directing said water to said flat upper surface of said grinding wheel through conduits, and

means for collecting excess water from said grinding wheel and returning said water to said receptacle,

whereby water directed to said grinding wheel will be flung from said outer circumference of said wheel upon rotation of said wheel against said guard even when said upper surface is exposed above said upper edge.

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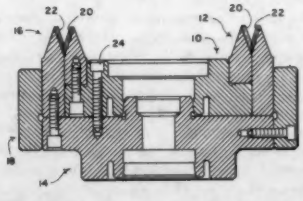
**4,388,781**

## ROTARY TOOL FOR STRADDLE GRINDING

**Harry D. Dodd, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.**

**Filed Sep. 21, 1981, Ser. No. 304,218**
**Int. Cl.³ B23F *21/03***
**U.S. Cl. 51—206 R** **6 Claims**



**1.** A rotary tool having two stock-removing surfaces pro-

jecting from a face thereof, said two stock-removing surfaces being arranged in side-by-side paths so that said rotary tool can be used to straddle a tooth of a gear on a workpiece to thereby form or finish said tooth, said rotary tool being characterized by an assembly of components which permits easy disassembly, renewal, and reassembly of said stock-removing surfaces, said components comprising

a first disc-shaped body for carrying an inner stock-removing surface of the tool, said first disc-shaped body having a recess formed about its outer periphery for receiving a first annular element having (a) a base portion for securement in said recess and (b) a stock-removing surface which projects outwardly from the face of said first disc-shaped body, and said first disc-shaped body having a bore through its center,

a second disc-shaped body for carrying an outer stock-removing surface of the tool, said second disc-shaped body having a diameter which is sufficiently larger than the diameter of said first disc-shaped body to provide an annular space between the outer circumference of said first disc-shaped body and a ring member which is carried around the circumference of said second disc-shaped body, said annular space being of a size and shape for receiving a second annular element having (a) a base portion for securement in said annular space and (b) a stock-removing surface which projects outwardly from the face of said first disc-shaped body, and said second disc-shaped body having a bore through its center,

said first and second disc-shaped bodies being shaped and dimensioned to be secured together in a way which provides concentric support for said inner and outer stock-removing surfaces relative to each other, including means for aligning said bores of said first and second disc-shaped bodies, and

a ring member for containing said second disc-shaped body and for supporting said second annular element.

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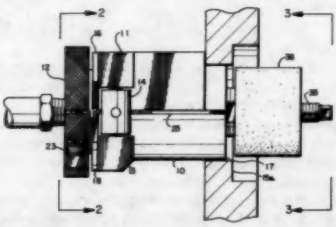
**4,388,782**

## HANDHOLE SEAT RESURFACING TOOL FOR NAVAL PRESSURE FIRED BOILERS

**David T. Rodgers, Turnersville, N.J.; Thomas P. Tursi, Horsham, and Thomas J. Bryan, Woodlyn, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 24, 1981, Ser. No. 258,068**
**Int. Cl.³ B24B *15/00***
**U.S. Cl. 51—241 A** **12 Claims**



1. An apparatus for grinding a circular sealing surface behind an oblong opening of a boiler wall or the like, the central axes of the opening and the surface being coaxial, comprising:

an expandable housing having a longitudinal split in an outer wall and shaped at one end for contiguous insertion on the central axes normal to the opening;

a tensioner coaxially extending through said housing and rotatable in said housing on the central axis;

a motor longitudinally secured within said tensioner having an output shaft rotatable on an axis displaced from the central axis for extending through the opening when said housing is inserted; and

a grinding wheel mounted on said shaft for rotation therewith configured to form the desired sealing surface.

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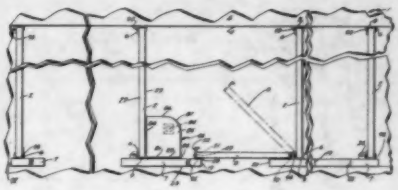
**4,388,783**

## PREFABRICATED PARTITION ARRANGEMENT

**Charles F. Logie, Spring Lake, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.**

**Filed Jun. 23, 1980, Ser. No. 162,096**
**Int. Cl.³ E04H *1/2***
**U.S. Cl. 52—36** **51 Claims**



1. A prefabricated partition arrangement for fitting rooms and the like, comprising:

a pair of side panels having rearward edges thereof adapted for placement adjacent a wall; said side panels being laterally spaced apart, extending outwardly from the wall in a substantially parallel relationship, and including forward edges;

a front panel extending between the forward edges of said side panels to partition off an area between said panels and the building wall; said front panel including an opening therein to permit access to the partitioned area, and means for selectively closing said opening;

a first pair of channels extending along a major portion of the side panel forward edges and positioned between the same and said front panel; said channels having a web portion fastened to said front panel, and a pair of flanges between which said side panel forward edges are received;

a second pair of channels extending along a major portion of the side panel rearward edges and positioned between the same and the wall; said second pair of channels having a web portion shaped for fastening to the wall, and a pair of flanges between which said side panel rearward edges are received;

said flanges of said first and second pairs of channels being spaced apart a distance greater than the thickness of said panel edges received therebetween to accommodate for panel warpage and other similar deformation; said channels being asymmetrical, with an interior one of said flanges longer than an exterior one of said flanges;

means for fastening said side panels with the associated pair of channels, thereby forming a rigid, postless partition assembly; said fastening means comprising fasteners which extend through and along only the longer, interior channel flange, and drawing the associated panel edge against the same, so as to present a neat, straight edge.

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**4,388,784**

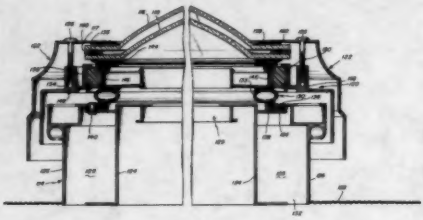
## THERMAL BREAK SKYLIGHT

**Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.**

**Filed Aug. 4, 1980, Ser. No. 175,305**
**Int. Cl.³ E04B *7/18*; E06B *7/14, 7/098***
**U.S. Cl. 52—200** **5 Claims**

1. A skylight construction for an opening in a building comprising;

a frame means extending about the opening and including means securable about the opening,
translucent or transparent means covering the opening and extending at edges to overlie the frame means,
means for retaining the covering means on the frame means,
said frame means comprising a base frame and a support frame overlying the base frame,
and a compliant sealing means extending contiguously about and overlying the base frame and for sealing between the base frame and support frame,
said base frame having thermal break means for minimizing heat transfer through the base frame,



said support frame including an inner frame section, an outer frame section and second thermal break means disposed between and joining the inner and outer frame sections,
said inner frame section having an upright wall forming a means on one side for holding the second thermal break means and forming on the other side thereof, at least a part of a condensation gutter,
a gasket carried by and overlying the inner frame section,
and means defined in the inner frame section over the upright wall for retaining the gasket in place.

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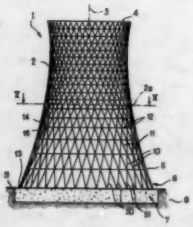
**4,388,785**

## COOLING TOWERS

**Corentin Queffelec, Sceaux; Rene Bordet, Courbevoie, and Marc Malinowsky, Verrieres-Le-Buisson, all of France, assignors to Electricite de France (Service National), Paris, France, by said Rene Bordet**

**Filed Jul. 22, 1980, Ser. No. 171,157**
**Claims priority, application France, Jul. 24, 1979, 79 19000**
**Int. Cl.³ E04B *1/32, 1/00;* E04C *3/26***
**U.S. Cl. 52—222** **15 Claims**



1. A tower for use as a cooling tower or a chimney comprising:
a plurality of rigid frames which are interconnected to form a trellis framework and which frames each define an internal periphery forming a mesh, an external periphery in the form of a polygon by which the frames are juxtaposed, an interior face and an exterior face, which faces are turned towards the inside and outside of the tower respectively;
means for assembling each frame of the framework to at least one adjoining frame in a position in which a part of the external periphery of the frame which corresponds to substantially the entire length of one side of the said polygon is in contact with a part of the exterior periphery of an adjoining frame, said means for assembling being situated along said parts of the adjoining frames so that connected parts of the two adjoining frames define a bar of the trellis framework; and
casing means attached to the framework for covering at least a part thereof, which casing means comprises sheeting, and means for attaching the sheeting to the frames to cover the meshes so that the position of the sheeting, in relation to the exterior face of a frame, is recessed towards the interior face by a value which is selectively adjustable between zero and the distance which separates the interior face from the exterior face inclusive, the said value being predetermined according to the degree with which it is desired to form a broken up external surface on the tower.

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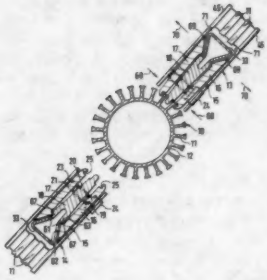
**4,388,786**

## CONSTRUCTION MEANS FOR USE IN THE ASSEMBLY OF WALL AND/OR ROOF STRUCTURES

**Kurt Gassler, Bühlweg 4, D-7050 Waiblingen-Neustadt, Fed. Rep. of Germany**

**Filed Jan. 30, 1981, Ser. No. 230,260**
**Int. Cl.³ A47G *29/00;* F16B *9/00;* E04B *2/78***
**U.S. Cl. 52—282** **19 Claims**



1. Construction means for use in the assembly of walls and/or roof structures, comprising:
a. a body having a receptacle and including inside surfaces and an aperture therethrough;
b. stanchion gripping means, comprising:
i. a central wedge-shaped positioning element having a positioning member on one end thereof;
ii. a pair of gripping elements having opposed gripping ends on one end thereof pivotably mounted on either side of said central element;
iii. said central element and said pair of gripping elements each having a cooperating aperture therethrough; and,
iv. said gripping ends associated with said positioning member;
c. said stanchion gripping means positioned in said receptacle whereby said cooperating apertures are co-axial with said body aperture;
d. said gripping means engageable with a pair of cooperating shaped stanchions whereby said positioning member is positioned between said pair of stanchions and each of said gripping ends is associated with a stanchion outside surface adjacent each of said gripping ends; and,
e. tensioning means insertable in each of said apertures to pivot said gripping elements and cause said gripping ends to securely grasp said stanchions and to pivot each of said gripping elements other end against said receptacle inside surfaces and to thereby secure said stanchion gripping means therein.

4,388,787

## POLE CONSTRUCTION

Arnold M. Millbright, Redwing, Minn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 43,729, May 30, 1979. This application Jun. 16, 1981, Ser. No. 274,299

Int. Cl.³ E04H 12/22; E02D 27/42

U.S. Cl. 52—298 11 Claims

1. A pole construction comprising:

a wood upper pole;

a lower pole section of tubular construction and being constructed of steel plate over its entire length, said lower pole section having one end portion adapted for insertion into the ground to a predetermined depth, said lower pole section having a continuous tubular wall with a cross section of a plurality of flat wall segments in each quadrant, each of said wall segments being oriented at obtuse angles with respect to adjoining wall segments; and

a steel plate diaphragm positioned within said lower pole section, oriented transversely to the wall of said lower pole section and adapted to engage the lower end of said upper pole for vertically supporting said upper pole by transferring the weight of said upper pole to the wall of said lower pole section, said lower pole section directly transferring said weight to the ground, said diaphragm conforming to the shape of the interior periphery of said wall and being affixed to said wall, said diaphragm cooperating with the wall of said lower pole section to provide a receiving chamber for and end portion of said upper pole, said receiving chamber being filled with a grout after said upper pole is placed in said chamber.

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4,388,788

## WOOD FLOOR PANEL

Lewis R. Bosco, East Berlin, Pa., assignor to Penn Wood Products Co., E. Berlin, Pa.

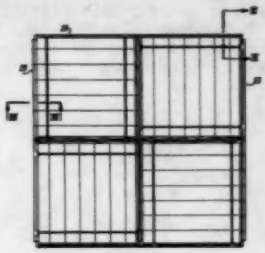
Filed Jul. 31, 1980, Ser. No. 174,141

Int. Cl.³ E04F 13/08

U.S. Cl. 52—390 17 Claims

1. A wood floor panel having a top wear surface, an undersurface for mating with a substrate and four side edges comprising:

a plurality of wood panel sections each having a top wear surface, an undersurface, and side edges, each said panel section including a plurality of substantially identical solid wood strips arranged in parallel side by side relationship and interconnected by at least two wires frictionally engaged in respective channels provided in the undersurface of and extending transversely to the strips of said sections, each said panel section abutting at a side edge thereof with a side edge of an adjacent panel section and the area of abutment of adjacent panel sections including an adhesive well formed in the undersurface of said panel sections, an adhesive bead provided in each of said adhesive wells for interconnecting and holding said abutting panel sections



together, and tongues provided along the entire length of two side edges of said panel and complementary grooves provided along the entire length of the remaining two side edges of said panel.

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4,388,789

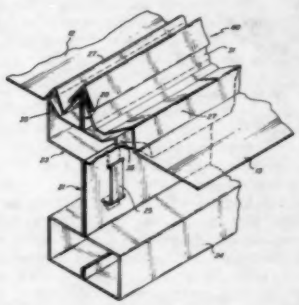
## CLOSURE APPARATUS FOR BUILDING PANELS

Wesley T. Murphy, 947 Prospect St., Auburn, N.Y. 13021

Filed Dec. 22, 1980, Ser. No. 219,263

Int. Cl.³ E04D 1/00

U.S. Cl. 52—461 2 Claims



1. Apparatus for joining a pair of coplanar panels to a metal support beam to provide a weathertight joint that includes

a metal support beam having a generally horizontal support flange and a pair of back to back vertical web sections that extend upwardly from the flange and which are turned downwardly away from each other to form a pair of opposed oblique runners that are disposed along the length of the beam,

a pair of flat sheetmetal roof panels, each panel being supported upon the flange of said beam on either side of the raised web section, the adjacent ends of the panel being obliquely turned in an upward direction under one of the overlying runners to form an overlapping joint therewith,

a V-shaped spring having a pair of downwardly disposed legs, the ends of which are folded inwardly upon themselves to form a pair of locking pads, the inside surfaces of the legs being biased in contact against the outside surfaces of the two opposed runners and the pads passed beneath the joints into contact with the adjacent obliquely turned ends of the panels, and

locking means acting between the flange of the beam and each of the panels for preventing the panels from moving

laterally towards and away from the web section whereby the panels are locked to the beam.

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**4,388,790**

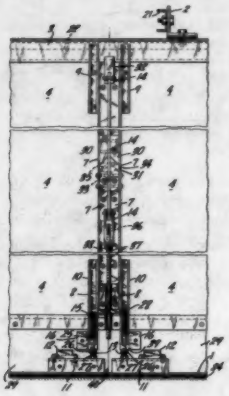
## PARTITION AND PANELING SYSTEM

**Michael Greco, 14 Woodlands La., White Plains, N.Y. 10607**

**Filed Jun. 29, 1981, Ser. No. 278,638**

**Int. Cl.³ F16B 5/06; E04C 1/10, 1/30; E04H 1/00**

**U.S. Cl. 52—584** **11 Claims**



1. A partition system wherein wall panels may be secured to the ceiling support and floor and in an abutting relationship to each other to form a continuous wall comprising:

a head section coupled to the ceiling support and including top guide channels extending downwardly therefrom with a recess therebetween,

at least one joint connector angle mounted on the rear edge of adjacent wall panels

a base mounted to the floor and having bottom channel members extending upwardly therefrom, and, stop blocks extending inwardly within the channel aperture, fastening means mounted within the top guide channel at its upper end and the bottom guide channel at its lower end and having a fishtail-shaped connector mounted at an intermediate portion to engage each joint connector angle, and,

means for moving the fastening means in a direction to bring about locking engagement of the joint connector angle and the mating connector.

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**4,388,791**

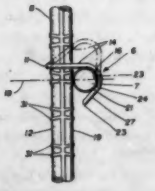
## REBAR TIE

**Frank H. Anderson, 1580 Grand View Dr., Berkeley, Calif. 74705**

**Filed Apr. 28, 1980, Ser. No. 144,556**

**Int. Cl.³ E04C 5/16**

**U.S. Cl. 52—719** **2 Claims**



1. In reinforced concrete construction having horizontally spaced vertically extending rebars, and engaged vertically spaced horizontal rebars and tie means securing said rebars at points of intersection and temporarily supporting said horizontal rebars on said vertical rebars, the improvement comprising said tie means and being a one-handled, single-motion, snap-on clip composed of:

an elongated member formed of stiff resiliently yielding material having a curved saddle shaped mid-portion sized to seat on the posterior side of said vertical rebar away from said horizontal rebar and having a pair of parallel legs extending from said mid-portion in the plane of curvature thereof; said legs having a length dimensioned to extend across the top of said horizontal rebar and being curved in parallel planes perpendicular to said first-named plane to provide concavities sized to grip said horizontal rebar and to effect supporting engagement thereof below its horizontal center plane, whereby downward load imposed on said horizontal rebar will be translated into arcuate displacement of said legs about said mid-portion into lateral pressure of said horizontal rebar against the anterior side of said vertical rebar, said concavities having an arcuate form having an interior peripheral surface subtending more than 90° but less than 180°; and

said legs having free ends extending substantially tangentially from said concavities and being spaced from said mid-portion by a distance less than the distance between said concavities and said mid-portion and said legs being dimensioned so that said free ends in said arcuate displacement will have a locus of movement intersecting the curved anterior side of said horizontal rebar above and adjacent to its horizontal center plane thus producing a wedged opening of said concavities upon downward arcuate displacement of said legs followed by snap action gripping of said horizontal rebar, the portions of said legs between said concavities and ends comprising levers for springing open said concavities into supporting engagement of said horizontal rebar.

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**4,388,792**

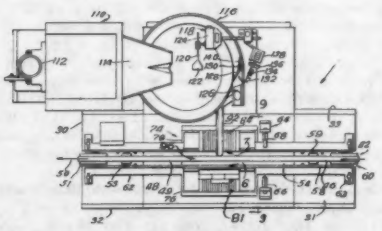
## APPARATUS FOR PACKAGING MAGNETIC ARTICLES

**Joseph A. Armond, River Forest; Gabriel R. Buky, and Fred Patrick, both of Chicago, all of Ill., assignors to Electro-Matic Products Co., Chicago, Ill.**

**Filed Jul. 31, 1980, Ser. No. 173,977**

**Int. Cl.³ B65B 5/10, 63/00**

**U.S. Cl. 53—236** **8 Claims**



1. Apparatus for packaging magnetic articles, comprising,

a fill conveyor for conveying moxes along a path and having a fill position in the path,

means for intermittently moving the conveyor and stopping it with a box thereon in the fill position,

means for placing a quantity of the articles in the box at fill position and including a spout for conducting them in a downwardly flowing stream, and further including means for reciprocating the spout along the path through the length of the box while placing the articles in the box,

the apparatus including magnetizing/demagnetizing means for magnetizing and demagnetizing the articles in the box,

the apparatus further including demagnetizing means being

operative for forming a field extending throughout the range of reciprocation of the spout and thereby effective throughout that range for demagnetizing the articles in said downwardly flowing stream in the spout,

the magnetizing/demagnetizing means being operative for magnetizing the articles in the box at the fill position to align them in predetermined position in the box, and

the magnetizing/demagnetizing means being operative for demagnetizing the articles in the box at the fill position, after they have been so magnetized.

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**4,388,793**

## APPARATUS FOR EMPTYING ENVELOPES

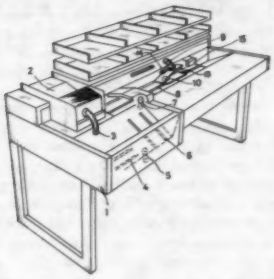
**Wolfgang Künne, Rellingen, Fed. Rep. of Germany, assignor to Stielow GmbH, Norderstedt, Fed. Rep. of Germany**

**Filed Mar. 9, 1981, Ser. No. 242,145**

**Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012857**

**Int. Cl.³ B65B *43/30***

**U.S. Cl. 53—381 R** **6 Claims**



1. An apparatus for emptying the contents of envelopes having at least two adjacent opened edges comprising: a pair of suction devices positioned for facing and holding opposite sides of an envelope to be emptied, wherein one suction device for holding one envelope side is movable perpendicular to the envelope plane for separating the sides of the envelope and wherein the other suction device for holding the opposite envelope side is movable along the envelope plane for providing relative movement between the envelope and envelope contents as the suction device movable perpendicular to the envelope plane separates the sides of the envelope.

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**4,388,794**

## APPARATUS FOR CUTTING AND TRANSPORTING BLANKS FROM A WEB OF FLEXIBLE MATERIAL

**Heinz H. Focke, and Kurt W. Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany**

**Division of Ser. No. 18,375, Mar. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 700,949, Jun. 29, 1976, Pat. No. 4,151,699. This application Sep. 24, 1980, Ser. No. 190,141**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2530002**

**Int. Cl.³ B65B *41/12, 61/08***

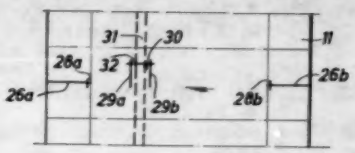
**U.S. Cl. 53—389** **3 Claims**

1. Apparatus for the production of packaging blanks by separation at a cutting station from a thin, highly flexible packaging material supplied in a continuous web and feeding in a blank for a package to be covered by said blank, comprising in combination:

a pair of drawing rollers for transporting said web longitudinally at a first speed;

first and second continuous longitudinally running perforated conveyor belts, said belts transporting said web longitudinally at a second speed greater than said first speed of said drawing rollers, said belts each comprising suction means for grasping lateral portions of said web to provide support for said web on said belt;

means for divergingly guiding said belts in the direction of transport of said belts; and




said belts extending through and beyond said cutting station for transporting blanks cut from said web to a folding orifice for folding a blank around an item to be packaged.

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**4,388,795**

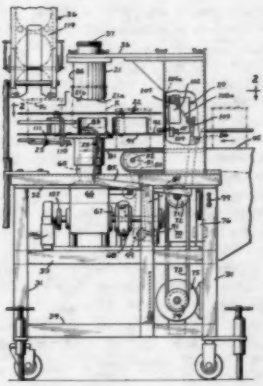
## METHOD AND APPARATUS FOR FILLING CONTAINERS

**Roger H. Stohlquist, and Leo Strombeck, both of Rockford, Ill., assignors to Anderson Bros. Mfg. Co., Rockford, Ill.**

**Filed Sep. 22, 1980, Ser. No. 189,625**

**Int. Cl.³ A21C *15/04***

**U.S. Cl. 53—435** **16 Claims**



1. A method of filling open-top containers with flowable semi-solid material comprising, flowing a semi-solid material in continuous fashion through a downwardly opening nozzle, the nozzle having a lower edge portion at one side thereof defining a material shear edge for shearing the semi-solid material in the container from the semi-solid material in the nozzle, advancing an empty container along a container infeed path to a filling station below the nozzle, elevating the container at the filling station into at least partial telescoping relation on the nozzle, lowering the container on the nozzle as it is filled until the upper edge of the container is at a level spaced below the material shear edge at said one side of the nozzle, moving the filled container from a position below the nozzle along a filled container discharge path extending across the material shear edge at said one side of the nozzle, the movement of the container along said filled container discharge path producing a material void in the top of container adjacent the side of the container that leads during such movement, controlling the relative vertical position of the nozzle and container during movement of the container across the material shear edge on the nozzle to initially maintain the upper edge of the filled container spaced below at least a portion of the material shear edge on the nozzle to shear off the material at a level above the

top of the container and to subsequently move the filled container and nozzle vertically toward each other sufficient to cause the trailing upper edge portion of the filled container to substantially wipe across the material shear edge at said one side of the nozzle, and pressing a cover down onto the open top of the filled container to press the material above the top of the container into the material void in the container.

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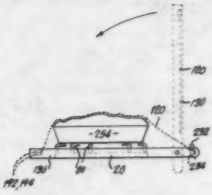
**4,388,796**

## STRETCH WRAP SYSTEM AND METHOD OF PACKAGING

**Seymour Zelnick, Bridgewater, N.J., assignor to Weldotron Corporation, Piscataway, N.J.**

**Filed Oct. 14, 1980, Ser. No. 196,852**
**Int. Cl.³ B65B *11/02***
**U.S. Cl. 53—441** **37 Claims**



1. A method for stretch wrapping a product comprising
loading a product onto a support surface, mounting a frame along a substantially horizontal pivot axis adjacent the product support surface, said frame having slidably movable film clamping means adapted to grasp the end of a length of stretch film,
loading stretch film into said frame by moving said film clamping means to draw said length of stretch film across said frame while said frame is being maintained at a substantially upright position, and maintaining it clamped in a sheet-like condition in said frame,
pivoting said frame downwardly from its substantially upright position to a substantially horizontal plane over a product positioned on the product support surface to stretch the film in the frame over the product,
releasing the clamped film from the frame to allow its edges to withdraw toward said product, and
tucking the edges of the film under the product as the film is being released from a clamped condition in the frame.

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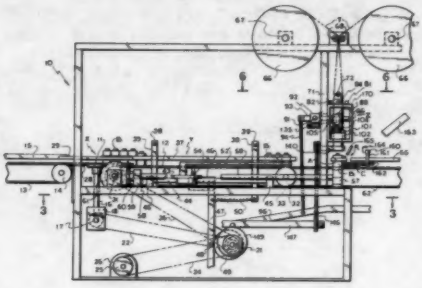
**4,388,797**

## BANDING MACHINE

**Walter A. Shields, 181-41 Henley Rd., Jamaica, N.Y. 11432**

**Filed Nov. 3, 1980, Ser. No. 203,085**
**Int. Cl.³ B23B *5/14*; B65B *11/18*; B65G *25/10***
**U.S. Cl. 53—585** **16 Claims**

1. A machine for continuously forming and applying bands on articles, comprising:
means for arranging the articles into at least one row;
at least one means for receiving the articles from the arranging means and transferring the articles to a band receiving position;
means for supplying at least one tubular member to be fabricated into a band; and
at least one means for continuously fabricating the bands from the tubular member and positioning the bands on the articles at the band receiving position, said fabricating and positioning means including,
means for feeding the tubular member in increments corresponding to the width of the band to be fabricated, said feeding means having a substantially cylindrical member with the tubular member passing around the cylindrical member; at least one first roller outside both of the cylindrical and tubular members and rotatable by first power means; and at least one rotatable second roller on the surface of the cylindrical member opposite said first roller so that when the first roller rotates, the tubular member between the first and second rollers is impelled at a distance equivalent to the width of a band;
means for cutting the tubular member to fabricate the band, said cutting means having a hollow pulley rotatable by second power means through which the tubular member passes; a knife; means for rotatably connecting the knife and the hollow pulley; and means to shift the knife between a cutting position and a non-cutting position; and



means for retaining the tubular member as it is cut into a band, and positioning the band on an article,
said connecting means including a movable plate; a shaft extending through the hollow pulley with an upper end connected to the movable plate and a lower end connected to the knife; a rod attached to the movable plate for shifting orientation of the movable plate; and a spring positioned between the pulley and the movable plate for urging the movable plate between cutting and non-cutting positions.

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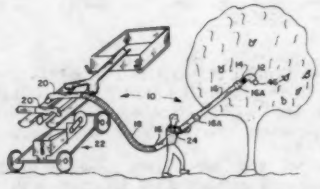
**4,388,798**

## FRUIT HARVESTING MACHINE

**Curtis E. Gerber, 4015 Bayshore Blvd. 8C, Tampa, Fla. 33611**

**Filed Jun. 9, 1981, Ser. No. 271,943**
**Int. Cl.³ A01G *19/08***
**U.S. Cl. 56—334** **11 Claims**



1. A picker head for connection to a vacuum operated fruit harvesting machine, comprising in combination:
an input conduit having an internal wall;
an outlet disposed at one end of said input conduit, said outlet being in fluid tight connection with a source of partial vacuum associated with said harvesting machine;
an inlet of said input conduit, said inlet disposed remote from said outlet; and
a gripping means for gripping the stem of a fruit; and means mounting said gripping means in an angular relationship relative to said internal wall of said input conduit and adjacent said inlet enabling at least a portion of said internal wall of said input conduit to function as a fulcrum when said gripping means is gripping the stem of the fruit and the fruit is at least partically disposed in said input

conduit to intensify the force required to remove the fruit from the fruit stem.

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**4,388,799**

## APPARATUS FOR TRACKING THE PITCH OF HELICAL GROOVES

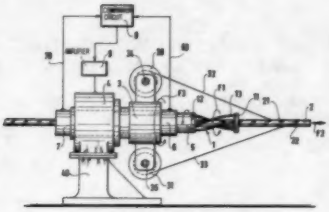
**Jean-Patrick Vives, Calais, France, assignor to Les Cables de Lyon, Clichy Cedex, France**

**Filed Mar. 22, 1982, Ser. No. 360,539**

**Claims priority, application France, Mar. 20, 1981, 81 05593**

**Int. Cl.³ B65H *81/08*; D07B *5/00***

**U.S. Cl. 57—6** **7 Claims**



1. Apparatus for tracking the paths of helical grooves in the periphery of a longitudinal cylindrical core driven in axial translation, said apparatus comprising two disks fitted onto said core, said disks being connected together by metal wires at their ends forming springs between the disks which press on respective grooves to track their apparent rotation when said core moves in axial translation.

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**4,388,800**

## METHOD OF MANUFACTURING AN OPTICAL FIBRE CABLE

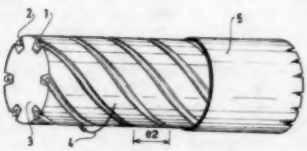
**Jean-Pierre Trezeguet, and Jean-Patrick Vives, both of Calais, France, assignors to Societe Anonyme dite: Les Cables de Lyon, Clichy, France**

**Filed Jan. 7, 1982, Ser. No. 337,891**

**Claims priority, application France, Jan. 9, 1981, 81 00281**

**Int. Cl.³ D02G *3/36*; G02B *5/16***

**U.S. Cl. 57—7** **3 Claims**



1. A method of manufacturing an optical fibre cable comprising a generally cylindrical elongate central support structure with helical grooves formed about its periphery to accommodate optical fibres, the improvement wherein said method consists in laying fibres whose cross-section is larger than the cross-section of the grooves in said grooves, providing a cover about the periphery of said central support structure to protect the fibres against radial compression forces, and in then partially untwisting the fibre-containing grooves, thereby lengthening the pitch of the grooves and hence increasing the length of the optical fibres relative to the length of the grooves to improve the mobility of the fibres in the grooves to provide an assembly which permits tractive stresses which elongate the support structure, thereby providing optical fibres whose length is sufficiently longer than the grooves than that of the support structure so that the tractive forces are not transmitted to the fibres as long as said support structure does not reach its breaking elongate limit.

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**4,388,801**

## PROCESS AND APPARATUS FOR PRODUCING A TWISTED ELASTIC THREAD

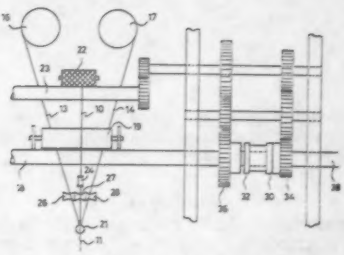
**Gunter d'Alquen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Krall & Roth, Weberei GmbH & Co., K.G., Mönchen-Gladbach, Fed. Rep. of Germany**

**Filed Apr. 1, 1981, Ser. No. 250,016**

**Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012753**

**Int. Cl.³ D01H *13/10, 1/26, 1/30***

**U.S. Cl. 57—12** **6 Claims**



1. A process for producing a twisted elastic thread wherein an elastomeric thread is adhesively twisted with two OE yarns, said yarns comprising yarns such as OE yarns of polyvinyl chloride, polyvinyl cyanide, polyacrylonitrile and/or wool threads produced by a process such as a rotor process, comprising the steps of:

surface-swelling said yarns under a vacuum between substantially 0.1 to 0.2 bar in superheated steam at substantially 70° C. for up to substantially ten minutes for loosening purposes, prior to twisting said yarns;

pre-tensioning said elastomeric thread with respect to said yarns such that the tension of said elastomeric thread is substantially the same as the tension of said yarns upon starting a twister; and

a predetermined time after starting said twister, pre-tensioning said elastomeric thread by substantially 2 to substantially 5 times compared with said yarns.

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**4,388,802**

## INTERNAL COMBUSTION ENGINE

**Hans Dinger, Friedrichshafen, and Helmut Klotz, Tettnang, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany**

**Filed Aug. 4, 1981, Ser. No. 289,837**

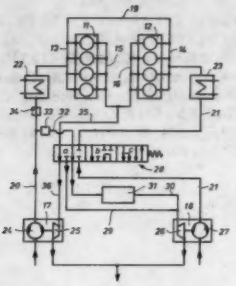
**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046875**

**Int. Cl.³ F02B *37/00***

**U.S. Cl. 60—606** **5 Claims**

1. An internal combustion engine comprising means for providing a supply of supercharging air for the engine, and an auxiliary combustion chamber means for improving an acceleration characteristic of the engine, characterized in that the supply means includes at least two exhaust gas turbocharger means operated in parallel, each of the turbocharger means includes a turbine means and a compressor means, means are provided for supplying an entire volume of exhaust gas from the engine only to one of the two turbocharger means during a partial load operation of the engine, means are provided for enabling the auxiliary combustion chamber means to operate at a full load during an accelerating of the engine in a low load range of operation of the engine, means are provided for sup-

plying exhaust gas from the auxiliary combustion chamber means to the turbine means of the other of the two turbocharger means, and in that means are provided for enabling the



compressor means of the other of the turbocharger means to supply supercharged combustion air for the full load operation of the auxiliary combustion chamber means.

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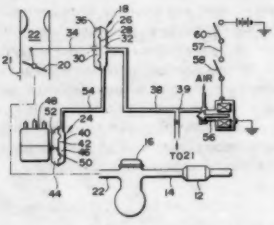
**4,388,803**

## SYSTEM FOR RAPIDLY WARMING UP CATALYTIC CONVERTER PROVIDED TO AUTOMOTIVE INTERNAL COMBUSTION ENGINE

**Katuji Furuya, Musashimurayama, and Tokuzo Yago, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jul. 9, 1981, Ser. No. 281,875**
**Claims priority, application Japan, Jul. 10, 1980, 55-94178**
**Int. Cl.³ F02P 5/04**
**U.S. Cl. 60—284** **6 Claims**



1. A system for rapidly warming up a catalytic converter provided to an exhaust passage of an internal combustion engine in an automobile to purify the exhaust gas, the engine including an intake passage with a throttle valve therein, the system comprising:

throttle opening means for increasing the opening degree of the throttle valve by a predetermined degree when a vacuum is applied to said throttle opening means;

ignition timing retarding means for retarding the ignition timing of the engine to a predetermined extent when a vacuum is applied to said ignition timing retarding means;

a vacuum passage which connects said ignition timing retarding means to the intake passage at a section downstream of the throttle valve via said throttle opening means;

an electromagnetic valve provided to said vacuum passage at a section between the intake passage and said throttle opening means such that an intake vacuum produced in the intake passage by the operation of the engine is applied through said vacuum passage to said throttle opening means and said ignition timing retarding means while said electromagnetic valve is electrically actuated;

an engine-temperature switch which is included in a circuit for actuation of said electromagnetic valve and operates when the temperature of the engine is below a predetermined temperature; and

a gear-position switch which is included in said circuit and operates in response to the neutral position of a transmission of the engine, said engine-temperature switch and said gear-position switch being connected with each other such that said electromagnetic valve is actuated when both said engine-temperature switch and said gear-position switch operate.

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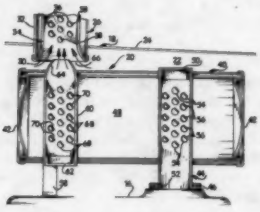
**4,388,804**

## EXHAUST ASSEMBLY FOR TRACTORS

**Richard W. Bushmeyer, Burlington, Wis., assignor to J. I. Case Company, Racine, Wis.**

**Filed Aug. 17, 1981, Ser. No. 293,556**
**Int. Cl.³ F01N 5/04**
**U.S. Cl. 60—319** **5 Claims**



1. An exhaust assembly for a tractor, said tractor having an engine, an exhaust manifold connected to said engine, and an engine hood substantially covering said engine thereby forming an engine compartment around said engine wherein said engine hood being adapted for pivotal or slidable movement to permit an operator access to said engine for repairs and the like, said exhaust assembly including:

an elongated exhaust conduit attached to said engine hood including a lower end that forms an enlarged opening for receiving exhaust gases, fresh air and fumes from said engine compartment and engine;

a tubular housing mounted in close proximity to said engine, said housing including opposed end plates closing its ends and an inlet conduit extending through the interior of said tubular housing adjacent one of its ends, said inlet conduit being closed at one end and having its opposite end connected to said exhaust manifold, the longitudinal axis of said inlet conduit being substantially perpendicular to the longitudinal axis of said tubular housing, and said inlet conduit including apertures and gas directing means along its length, the exhaust gases from said engine being forced into said inlet conduit and then directed in a horizontal swirling fashion by said apertures and gas directing means through the interior of said tubular housing thereby providing a first stage of exhaust gas cooling and muffling; and

an outlet conduit extending through the interior of said tubular housing adjacent its other end, said outlet conduit being closed at one end and having an opposite conically shaped discharge end which terminates in close proximity to the lower end of said exhaust conduit, the longitudinal axis of said outlet conduit being substantially perpendicular to the longitudinal axis of said tubular housing, and said outlet conduit including apertures and gas directing means along its length, the enlarged opening formed at the lower end of said exhaust conduit being spaced from and surrounding the conical end of said outlet conduit to form an annular opening for drawing air and fumes from said

engine compartment into said exhaust conduit, and the exhaust gas from said engine being forced into said outlet conduit and directed outwardly through said conical end of said outlet conduit and into said exhaust conduit for discharge thereby providing a second stage of exhaust gas cooling and muffing and permitting the introduction of air from around the engine into the exhaust gas for diluting the exhaust gas.

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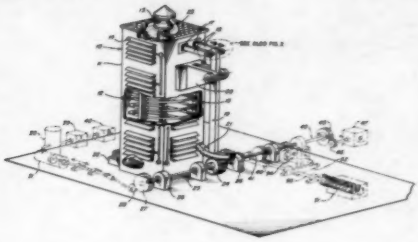
**4,388,805**

## POWER PLANTS DERIVING THEIR ENERGY FROM EXPANSION AND CONTRACTION

**Merle C. Rideout, Jr., 1 Roberts La., Cape Elizabeth, Me. 04107**

**Filed Jan. 21, 1981, Ser. No. 226,915**
**Int. Cl.³ F03G** *7/06*
**U.S. Cl. 60—527** **19 Claims**



1. A power plant including means operable to generate electricity, first means operable first to create and store energy and then to release energy to said generating means to effect operation thereof and second means operable first to create and store energy and then to release energy to said generating means to effect the operation thereof, means including a unit that expands and contracts to a predetermined extent when subjected to a temperature cycle within a predetermined range and during both expansion and contraction provides work strokes of predetermined maximum length, and means connecting said unit to said first and second storage means in a manner such that a work stroke in one direction operates said first storage means to create and store energy and said second storage means to release stored energy and a work stroke in the other direction operates said second storage means to create and store energy and said first storage means to release stored energy.

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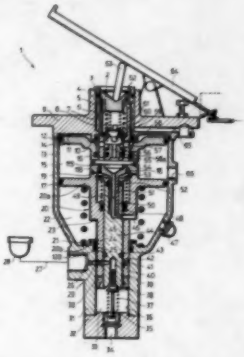
**4,388,806**

## HYDRO-PNEUMATIC OPERATING DEVICE ACTUATED WITH A PNEUMATIC PRESSURE-MEDIUM OR SERVO-OPERATION, IN PARTICULAR FOR MOTOR-VEHICLE CLUTCHES

**Istvan Szarka, and Janos Urbantsok, both of Budapest, Hungary, assignors to Autoipari Kutato es Fejleszto Vallalat, Budapest, Hungary**

**Filed Jun. 24, 1980, Ser. No. 162,676**
**Claims priority, application Hungary, Jun. 29, 1979, AU 426**
**Int. Cl.³ B60T** *13/00*
**U.S. Cl. 60—547.1** **2 Claims**

1. In a hydro-pneumatic operating device comprising a cylinder block, a hydraulic working cylinder in the cylinder block connected to a pressure-medium and having a hydraulic piston of a hydro-pneumatic piston, and a pneumatic servo-valve unit having a path-control actuated by an external operating element which cooperates with a first pneumatic servo-piston of said hydro-pneumatic piston; the improvement comprising, on the end face of a second pneumatic servo-piston **(14)** opposite to a pneumatic servo-chamber **(11)**, a supporting surface **(19)** adapted to contact a surface **(118)** on said first pneumatic servo-piston **(20*a*)** of the hydro-pneumatic piston **(20)**; the side of the first pneumatic servo-piston **(20*a*)** opposite the second pneumatic servo-piston **(14)** confining a blow-off chamber **(22)**; a cylinder section **(13)** of a pneumatic working chamber **(15)** enclosed by the hydro-pneumatic piston **(20)** and the second pneumatic servo-piston **(14)** having a connection **(66)** for pressure medium; the hydro-pneumatic piston **(20)** having a duct **(46)** leading to said blow-off chamber **(22)**, said blow-off chamber **(22)** having a blow-off unit **(47)** discharging to the free atmosphere; an axial bore **(51)** through said hydro-pneumatic piston **(20)** leading to said duct **(46)**, a shaft **(50)** in said bore, said shaft **(50)** having a longitudinal through-channel **(49)** communicating with a blow-off chamber **(119)** of the path controlling servo-valve unit, and in which in an axial through-bore **(120)** of the hydro-pneumatic piston **(20)**, there is disposed a sealed, axially displaceable piston-insert **(44)**, the extreme position of which is limited by a buffer element **(53)** in the hydro-pneumatic piston **(20)**, a spring **(52)** between the piston-



insert **(44)** and the hydro-pneumatic piston **(20)** which presses the piston-insert **(44)** toward the buffer element **(53)**, said shaft **(50)** of the blow-off unit of the servo-valve being disposed in a slidably telescopic and sealed manner in the bore **(51)** of the piston-insert **(44)**, said bore **(51)** of the piston-insert **(44)** continuously communicating through a duct **(45)** with said duct **(46)** leading into the blow-off chamber **(22)** of the second pneumatic servo-piston **(14)**, a compression spring **(21)** between the hydro-pneumatic piston **(20)** and an end face of the cylinder block **(31)**, the cylinder block **(31)** having a feed liquid connection which is connected to a duct **(41)** of the hydro-pneumatic piston **(20)** and to a conduit **(27)** which leads to a fluid tank **(28)**, said duct **(41)** being connected to a fluid-duct **(40)** in said piston-insert **(44)**, a valve seat **(38)** at the end of the feed-duct **(40)** leading to a hydraulic working chamber **(33)**, and a check-valve **(35)** closing in the direction of the fluid-duct **(40)** and engageable with said valve seat **(38)**.

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**4,388,807**

## GEOTHERMAL POWER EXTRACTION SYSTEM WITH ABOVE SURFACE HEATING OF WORKING FLUID

**Hugh B. Matthews, Boylston, Mass., assignor to Sperry Corporation, New York, N.Y.**

**Filed Mar. 25, 1981, Ser. No. 247,436**
**Int. Cl.³ F03G** *7/00*
**U.S. Cl. 60—641.4** **5 Claims**

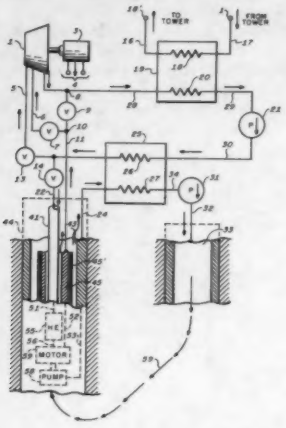
1. Geothermal deep well energy extraction apparatus of the kind in which solute-bearing water is pumped to a first station at the earth's surface from a subterranean second station by utilizing thermal energy extracted from said solute-bearing water for operating turbine-motor driven electrical generator means at said first station, said solute-bearing water being returned directly from said first station into reinjection well means, said extraction means including:

vapor generator means at said first station utilizing a first

portion of said thermal energy for supplying a working fluid for driving subterranean pump means for pumping said solute-bearing water from said second to said first station,

said vapor generator means being heated by said solute-bearing water before return to said reinjection well,

means for additionally supplying said working fluid for driving said turbine-motor driven electrical generator means by utilizing a second portion of said thermal energy,




means for condensing said working fluid exhaust vapor from the turbine motor of said turbine-motor driven electrical generator means, and

pump means for pumping said condensed working fluid exhaust in heat exchanging relation through said vapor generator means for parallel supply for driving said subterranean pump means and said turbine-motor driven electrical generator means.

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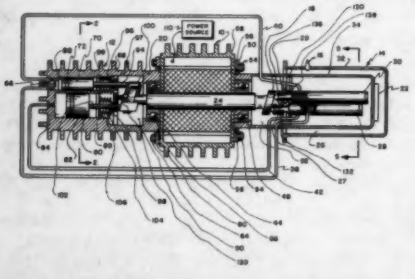
**4,388,808**

## SWASH PLATE DRIVING MEANS FOR CRYOGENIC COOLERS

**Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Feb. 17, 1982, Ser. No. 349,494**
**Int. Cl.³ F25B 9/00**
**U.S. Cl. 62—6** **14 Claims**




1. A swash plate driving means for cryogenic coolers, said driving means comprising:

a shaft rotating means having at least one swash plate on the shaft rotated thereby;

compressor means comprised of a plurality of piston rods interacting between said at least one swash plate and compression cylinders to produce pressure waves in a plurality of compression volumes; and

a regenerator means in a separate housing from said compressor means, said regenerator means comprised of a plurality of displacer regenerators operatively interacting with at least said pressure waves of said compressor means to provide cooling at a cold station within said regenerator means.

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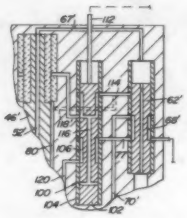
**4,388,809**

## CRYOGENIC REFRIGERATOR

**Domenico S. Sarcia, Carlisle, Mass., assignor to CVI Incorporated, Columbus, Ohio**

**Filed Apr. 19, 1982, Ser. No. 369,864**
**Int. Cl.³ F25B 9/00**
**U.S. Cl. 62—6** **14 Claims**



1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid flow path between said first chamber and said second chamber by the movement of said displacer means, the improvement comprising chamber means for guiding a slide connected to the displacer means, said slide having an axial passage communicating with one end of said chamber means remote from the displacer means, a motor coupled to said slide for controlling movement of the displacer means at top dead center and bottom dead center positions thereof, said passage in said slide having a restriction, a valve having a spool valve member for controlling flow the high and low pressure fluid, means including a conduit communicating one end of said spool valve member with said one end of said chamber means for introducing high fluid pressure into the conduit to shift the spool valve member when the displacer means is at one of the extremities of its movement.

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**4,388,810**

## STORAGE TANK FOR LIQUEFIED GAS SUCH AS METHANE

**Michel Guilhem, Au, Switzerland, assignor to Gaz de France, Paris, France**

**Filed Feb. 26, 1982, Ser. No. 352,757**
**Claims priority, application France, Mar. 19, 1981, 81 05497**
**Int. Cl.³ F17C 3/00**
**U.S. Cl. 62—47** **7 Claims**

1. A tank adapted for use in storing and transporting liquefied gas comprising:

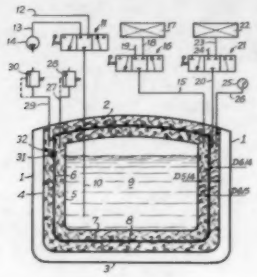
an internal vessel having a primary barrier wall defining a main space in which said liquefield gas is contained at a given pressure;

an intermediate vessel having a secondary barrier wall surrounding said internal vessel and defining a primary space between said internal vessel and said intermediate vessel;

an outer hull having a main wall surrounding said intermediate vessel and defining a secondary space between said intermediate vessel and said outer hull;

a gas located within said secondary space at a pressure at least equal to the pressure of said liquefied gas, said gas

having a sublimation temperature at or above the temperature of said liquefied gas, but below the service temperature of said secondary space whereby said gas freezes by



sublimation to form a solid barrier upon leakage of liquefied gas from said main space into said primary space; and means connected to said secondary space for selectively feeding gas under pressure to said secondary space.

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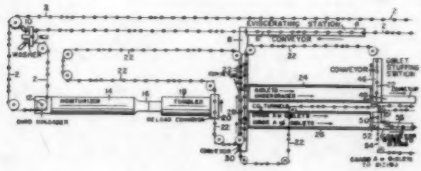
**4,388,811**

## METHOD FOR PREPARING POULTRY FOR FRESH-PACK HANDLING

**Ralph S. Zebarth, Gainesville, Ga., assignor to Meyn U.S.A., Inc., Baldwin, Ga.**

**Filed Sep. 22, 1981, Ser. No. 304,614**
**Int. Cl.³ F25D** *13/02*
**U.S. Cl. 62—63** **8 Claims**



1. A method of preparing eviscerated poultry carcasses for fresh-pack handling, having a predetermined allowable content of pick-up moisture, said method consisting of the successive steps of:

a. adding moisture in the form of water to eviscerated poultry carcasses with sufficient intimacy and thoroughness to ensure the pick-up of moisture by said carcasses well in excess of said predetermined allowable content plus the amount of moisture which may be removed from said carcasses by freeze-crusting thereof,

b. removing moisture from said carcasses to reduce the pick-up moisture content thereof to a level generally equal to said predetermined allowable content plus the amount of moisture which may be removed therefrom by freeze-crusting thereof, and

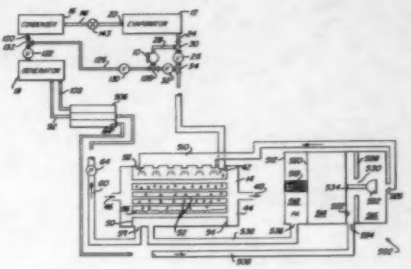
c. subjecting said carcasses to a supercold atmosphere for a time sufficient to freeze-crust the skin and surface portions thereof but not to freeze the deeper portions thereof, whereby the carcass skins shrink to expel moisture from said carcasses to reduce their pick-up moisture content to a level generally equal to said predetermined allowable amount.

**4,388,812**

## VARIABLE VALVE FOR REFRIGERATION SYSTEM

**Silas W. Clark, 1000 Greens Rd., #809, Houston, Tex. 77060**

**Division of Ser. No. 18,647, Mar. 8, 1979, Pat. No. 4,285,211, which is a continuation-in-part of Ser. No. 887,445, Mar. 16, 1978, Pat. No. 4,171,619. This application Apr. 10, 1981, Ser. No. 252,937**
**Int. Cl.³ F25B** *15/00*
**U.S. Cl. 62—141** **9 Claims**



1. In an absorption refrigeration system having generator means, condenser means, evaporator means for cooling output, absorber means, and a compressor for compressing refrigerant vapor passing between said evaporator means and said absorber means, said absorber means comprising means for delivering solution from the generator means to the absorber means, the combination with:

variable valve means between the generator means and the absorber means for controlling fluid flow to said absorber means in response to a pressure difference between said generator means and said absorber means, so that, as absorber pressure approaches generator pressure, said fluid flow to said absorber means increases to maintain a constant cooling output, said variable valve means metering chamber having an aperture with an area for passing absorber fluid; blocking means operatively associated with said aperture for increasing and decreasing effective aperture area for fluid flow through said valve means; and pressure difference sensing means response to a difference in pressure between absorber pressure and generator pressure and operably connected to said blocking means for decreasing said fluid flow in response to an increase of said difference in pressure.

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**4,388,813**

## SERVER FOR WINE BOTTLES AND THE LIKE

**James H. Gardner, and Noel H. de Nevers, both of Salt Lake City, Utah, assignors to Aurora Design Associates, Inc., Salt Lake City, Utah**

**Continuation of Ser. No. 171,901, Jul. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 61,655, Jul. 30, 1979, Pat. No. 4,255,944. This application Dec. 14, 1981, Ser. No. 330,556**
**Int. Cl.³ F25D** *3/08*
**U.S. Cl. 62—457** **4 Claims**

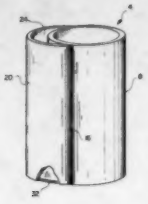
1. A server for wine bottles and the like comprising

a vertically elongate housing open at the top for receiving a bottle and having a side wall for surrounding the entire side exterior of the bottle, said side wall constructed of a heat conductive material to enable complete circumferential conduction in the side wall, and

receptacle means for holding ice in contact with a side portion of the exterior of said side wall, said receptacle including

an outer wall surrounding said side portion of the side wall to define a space therebetween for receiving ice, said outer

wall being joined to the side wall at a first generally vertical locus of points, and then looping outwardly from the first locus and about said space, and joining the side wall



at a second generally vertical locus of points spaced horizontally from the first locus, and

a bottom wall joining the bottoms of the outer wall and side wall to support ice placed in said space.

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**4,388,814**

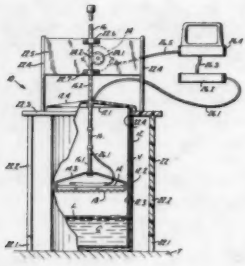
**CRYOGENIC DEVICE AND METHOD**

**Dean W. Schilling, 5049 Diane Dr., Minnetonka, Minn. 55343**

**Filed Mar. 26, 1982, Ser. No. 362,486**

**Int. Cl.³ F25D** *25/00*

**U.S. Cl. 62—62** **9 Claims**



1. Method of controlling the temperature of an object comprising

(a) providing an upwardly open vessel containing a liquid cryogen, the vessel having vertically continuous inner walls of high thermal conductivity to provide a vertical temperature gradient above the level of liquid cryogen,

(b) supporting the object within the container above the liquid cryogen, and sensing a temperature relative to the temperature of the object, and

(c) varying the vertical spacing of the object above the liquid cryogen level until the desired temperature is obtained.

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**4,388,815**

**PICK-PROOF LOCK**

**Michael S. Lawler, 7853 Melotte St., San Diego, Calif. 92119**

**Filed Sep. 8, 1980, Ser. No. 185,234**

**Int. Cl.³ E05B** *21/00, 35/04*

**U.S. Cl. 70—134** **9 Claims**

1. A pick-resistant bar lock comprising:

(a) a casing;

(b) a bar slideable in said casing in a longitudinal direction and defining at least one shear plane therewith;

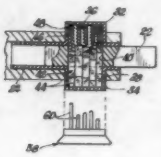
(c) a longitudinally extended slot passing laterally through said bar;

(d) a plurality of side-by-side contiguous tumblers disposed in a longitudinal row occupying the volume of said slot;

(e) a clearance cavity defined in said casing adjacent said slot and defining at least one shoulder extending to said shear plane to block said bar when said tumblers are misaligned with said shear plane;

(f) access means defined in said casing providing access to said tumblers for keying manipulation thereof;

(g) a second shear plane and second cavity defined in said casing on the opposite side of said bar from first cavity and shear plane, and each of said cavities defining two shoulders aligned with the edges of said slot when same is aligned with said cavity;



(h) said access means comprises a hole generally axially aligned with each tumbler defined in the portion of said casing defining one of said cavities;

(i) the other of said cavities houses springs biasing said tumblers toward said holes and said tumblers are operated by prongs projecting through said holes; and

(j) the portions of said casing defining said cavities are each provided with holes generally axially aligned with said tumblers and each of said cavities houses compression springs biasing said tumblers and each of said tumblers comprises at least two component tumblers to define two sets of shear surfaces to be aligned with said shear planes.

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**4,388,816**

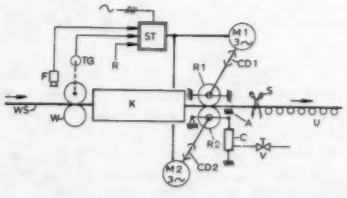
**METHOD AND APPARATUS FOR ROLLING A LENGTH OF METAL BAR OR WIRE**

**Florimond Ferket, Oudorp, and Cornelis A. Kuenen, Heerhugowaard, both of Netherlands, assignors to Estel Hoogovens B.V., IJmuiden, Netherlands**

**Filed Jan. 21, 1981, Ser. No. 226,944**

**Int. Cl.³ B21B** *37/00, 45/02*

**U.S. Cl. 72—11** **5 Claims**



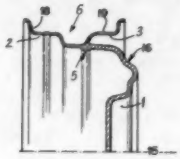

1. An improved method of rolling a length of metal bar or wire of the type where the metal length is passed through a roll stand and subsequently through at least one cooling device and then through an opposed pair of driven bridle rolls, and is maintained under tension in the cooling device by said bridle rolls which frictionally grip the metal length between them and which are driven, during passage of the metal length, with a power input which, if the metal length were absent, would cause the bridle rolls to rotate at a first peripheral speed of the bridle rolls higher than the rolling speed of the metal length in the roll stand, wherein the improvement comprises:

rotating the bridle rolls at a second peripheral speed higher than said first peripheral speed at the moment when the leading end of the metal length reaches the bridle rolls.

## 4,388,817
## VEHICLE WHEEL AND METHOD OF MANUFACTURING SAME

Rene R. Victor, Nogent-sur-Marne, France, assignor to Etablissements Letang & Remy, Paris, France

Filed Nov. 5, 1980, Ser. No. 204,376
Claims priority, application France, Nov. 30, 1979, 79 29540
Int. Cl.³ B21H *1/04*
U.S. Cl. 72—68 3 Claims



1. A method of manufacturing a vehicle hub of light weight alloy for rotation about an axis, comprising in combination the steps of:

forming a sheet of the alloy into a blank having a first portion for attachment to an axle aligned with the axis about which the hub rotates, the first portion having a sub-rim portion extending generally in the same direction as the axis of the hub, the blank further having a second portion extending radially from a juncture with the sub-rim portion;

splitting the second portion from the periphery thereof to the juncture with the sub-rim portion to form first and second circular flanges extending from the juncture with the sub-rim while thickening the juncture to form a reinforcing bead

while maintaining the thickness of the first circular flange, bending the first flange away from the sub-rim and also bending the first flange into a first rim portion for supporting one wall of an inflatable tire, and

while maintaining the thickness of the second circular flange, bending the second flange over the sub-hub and also bending the second flange into a second rim portion for supporting the other wall of the inflatable tire.

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## 4,388,818
## METHOD AND APPARATUS FOR FABRICATING PRECISION TEETH

Hans Krapfenbauer, Zurich, Switzerland, assignor to Firma Ernst Grob, Männedorf, Switzerland

Filed Sep. 4, 1981, Ser. No. 299,399
Claims priority, application Switzerland, Oct. 20, 1980, 7807/80
Int. Cl.³ B21H *5/00*
U.S. Cl. 72—81 11 Claims

1. A method for fabricating precision teeth with least one free tooth end at which there is first fabricated a workpiece with approximately shaped teeth, which are then finished rolled in a separate working cycle by cold working the teeth, comprising the steps of:

approximately fabricating the teeth by means of an addition of material;

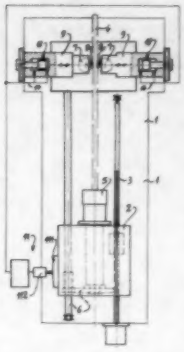
clamping said teeth for cold working thereof and performing a feed of the workpiece;

during such workpiece feed displacing the workpiece along its lengthwise axis and rotating such workpiece about said lengthwise axis;

during such movements of the workpiece machining the workpiece from the outside by means of substantially ring-shaped profiled rolling tools revolving in a substantially planetary-like manner in related rolling heads;

said machining step encompassing performing with each rolling tool in the tooth gaps in the same directional sense which predominantly extends in the teeth lengthwise direction individual rolling operations which are briefly effective in rapid sequence and accommodated to the tooth pitch-dependent workpiece feed, so that with the same rolling tool there are applied in the tooth gaps in succession successively performed individual rolling operations each located at a substantially screw-line shaped zone which is governed by the feed of the workpiece;

performing in the teeth lengthwise direction of the same



tooth gap successive individual rolling operations which overlap with respect to the application of the individual rolling operations at the workpiece; and

gradually adjusting the penetration depth of the rolling tools during the feed of the workpiece such that at each end region of the teeth adjacent to a free tooth end such penetration depth is smaller than at the remaining regions.

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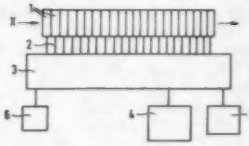
## 4,388,819
## ROLLING MILLS

Hermann Möltner, Grevenbroich, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Company, Hilden, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,713
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028210
Int. Cl.³ B21B *39/08, 35/00*
U.S. Cl. 72—234 4 Claims



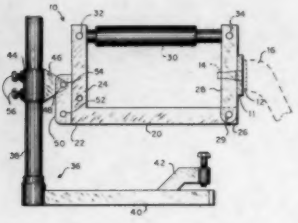
1. A rolling mill for the stretch-reducing of tubes, comprising a plurality of rolling stands which are arranged closely one after the other, a main motor and drive train drivingly connected to all of the rolls in said plurality of roll stands whereby the rolls are driven by said main motor and two auxiliary motors connected to said drive train, said drive train including planetary gear stages for combining the rotational speeds of the two auxiliary motors with that of the main motor such that a first group of rolling stands disposed at the entry end and a second group of rolling stands disposed at the delivery end are each driven by one of said auxiliary motors whose rotational speed is independently controllable and is superimposed on the rotational speed of the main motor which is common to all of the stands.

**4,388,820**

## CAMBER CORRECTION TOOL

**Kenneth W. Rickbeil, 227 Poppy, Monrovia, Calif. 91016**

**Filed Jan. 23, 1981, Ser. No. 227,547**
**Int. Cl.³ B21D *1/12*; B21J *13/00***
**U.S. Cl. 72—458** **10 Claims**



**1**. Corrective adjustment tool for adjusting camber of a wheel carried on a spindle and mounting plate assembly rigidly connected to a camber controlling member such as a trailing arm or McPherson strut while attached to a vehicle, said tool comprising:

a base defining support means supporting the tool in operating position;

a rigid bar having in normal operating position,

a first terminus remote to the mounting plate,

first arm means rigidly connected to said bar first terminus at a fixed angle, and,

a second terminus adjacent to the mounting plate,

second arm means engageable with said mounting plate and pivotally connected to said bar second terminus to define a fulcrum relative to said mounting plate; and

force application means engaged between said first and second arms and constructed and arranged to exert spreading or contracting force in parallel with said bar therebetween freely of pressure on said spindle to angularly vary the relative positions of said arms, whereby said mounting plate is pivoted about said fulcrum in camber controlling member bending relation against the weight of said vehicle, and camber adjusted thereby.

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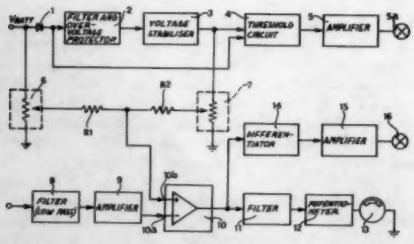
**4,388,821**

## APPARATUS FOR CALIBRATING THE CARBON MONOXIDE EMISSION UNDER IDLING CONDITIONS OF AN INTERNAL COMBUSTION ENGINE PROVIDED WITH A BOSCH L-JETRONIC ELECTRONIC INJECTION APPARATUS

**Pasquale Martinez, and Vittorio Di Nunzio, both of Turin, Italy, assignors to Fiat Auto S.p.A., Turin, Italy**

**Filed Mar. 4, 1981, Ser. No. 240,355**
**Claims priority, application Italy, Mar. 13, 1980, 67388 A/80**
**Int. Cl.³ G01M *15/00***
**U.S. Cl. 73—1 R** **5 Claims**




**1**. An apparatus for use in adjusting the fuel/air mixture strength under idling conditions of an Otto cycle internal combustion engine having a fuel injection system of the type provided with an electronic control unit including circuit means for the closed loop control of the mixture strength, a sensor responsive to the proportion of carbon monoxide in the exhaust gases located in the exhaust pipe, means for switching said sensor into and out of said circuit means and an integrator operable to generate, in dependence on signals from said sensor, a correction signal representative of the change in the mixture strength required to bring the mixture strength to the stoichiometric value, said adjustment being for the purpose of calibrating said fuel injection system to bring the carbon monoxide emission of the engine under idling conditions to within predetermined limits, said apparatus comprising means for determining the difference between the value of said correction signal when said sensor is switched into the circuit and the value of said correction signal when said sensor is switched out of the circuit including first and second resistors, a voltage stabilizer, an operational amplifier having first and second inputs, a first potentiometer having its resistive element adapted to be connected between a battery and ground and its wiper connected by said first resistor to said second input of said operational amplifier, means connecting said first input of said operational amplifier to the output of said integrator to receive said correction signal, a second potentiometer having its resistive element connected between the output of said voltage stabilizer and ground and its wiper connected by said second resistor to said second input of said operational amplifier and visual display means operating to provide a visual display of said difference.

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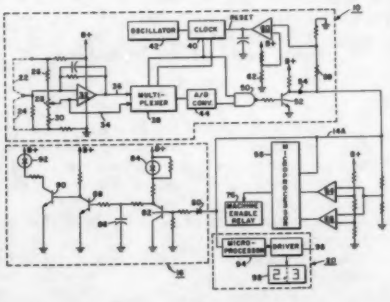
**4,388,822**

## ATMOSPHERIC SAMPLING SYSTEM

**Herbert Heller, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.**

**Filed Jul. 15, 1981, Ser. No. 283,537**
**Int. Cl.³ G01N *27/18***
**U.S. Cl. 73—23** **6 Claims**

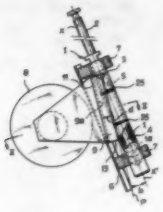



**1**. In an atmospheric sampling system, the combination of sensor means for producing an electrical signal indicative of a particular gas content in the atmosphere, means for producing first electrical pulses of essentially constant width, means for producing second electrical pulses whose widths vary as a function of said gas content in the atmosphere, means for comparing the widths of said first and second pulses, means for generating third pulses having a characteristic which varies as a function of the comparative widths of said first and second pulses, and indicator means actuated by said third pulses.

## 4,388,823
## APPARATUS FOR AUTOMATICALLY MEASURING THE VISCOSITY OF LIQUIDS

Guy Garnaud, and Roger Bouhier, both of Poitiers, France, assignors to Medica-Test, Saint-Benoit, France

Filed Mar. 10, 1981, Ser. No. 242,387
Claims priority, application France, Mar. 26, 1980, 80 06658
Int. Cl.³ G01N 11/12
U.S. Cl. 73—57 4 Claims

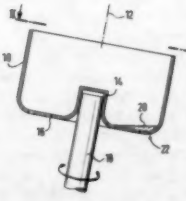


1. Apparatus for automatically measuring the viscosity of liquids, comprising in combination a viscosimetric tube (1), kept in an inclined position and containing a ball (3) made of magnetic material, means (2) for introducing the liquid to be tested in said tube and means for measuring the duration of fall of said ball (3) in the tube (1) containing the liquid, said means being associated with means for converting into viscosity the duration of fall of the ball (3) from the top of the tube, electromagnetic means for applying to said ball a magnetic field so as to maintain said ball at the top of said tube and means for suppressing the magnetic field and allowing the fall of the ball (3) in the tube (1), wherein said electromagnetic means (8) comprise an electromagnet having two poles with their ends (9a) being disposed relative to one another and defining an air gap (10) which is lengthy and narrow, along which the viscosimetric tube (1) is placed, with the distance (d) between said tube and the ends (9a) of the two poles (9) augmenting progressively between the top and the bottom of the tube (1), so as to create along the tube a magnetic field gradient directed towards the top of the tube which permits automatic rising of the ball from the bottom of the tube to the top of the tube when the electromagnet is energized.

## 4,388,824
## PROCESS AND AN APPARATUS FOR TESTING THE COAGULATION PROPERTIES OF LIQUIDS

Herbert Krone, Niedernkamp 11, D-4933 Blomberg, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,095
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007722
Int. Cl.³ G01N 33/48
U.S. Cl. 73—64.1 16 Claims



1. A process for testing a liquid with respect to coagulation thereof, comprising the steps of:

placing an amount of the liquid to be tested into an annular space within a sample vessel, said annular space being at a slope in relation to the horizontal and having a generatrix axis at an angle to the vertical, the amount of the liquid being sufficient to form a body within a lower part of said annular space stretching partly around said generatrix axis;

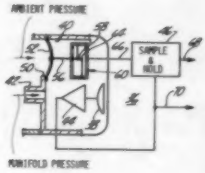
continuously rotating said vessel about said generatrix axis wherein the liquid upon coagulation is transported to a higher part of said annular space; and

sensing the presence of said coagulated liquid at the higher part of said annular space.

## 4,388,825
## INTEGRAL MANIFOLD ABSOLUTE PRESSURE AND AMBIENT ABSOLUTE PRESSURE SENSOR AND ASSOCIATED ELECTRONICS

Didier J. deValpillieres, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 17, 1977, Ser. No. 797,726
Int. Cl.³ G01L 23/24
U.S. Cl. 73—115 10 Claims




5. A manifold absolute pressure and ambient absolute pressure sensing system for providing a MAP and AAP signal for use in controlling the operation of an internal combustion engine including an electronic control unit, the improvement comprising a manifold pressure sensor adapted to sense the absolute manifold pressure of the engine, and a differential pressure sensor subject to absolute manifold pressure and ambient pressure including means for sensing the difference between the absolute manifold and ambient pressure, switch means connected to said difference sensing means including a sensing contact and a set contact, means for setting a preselected relationship between said contacts, sensing and set means to establish a difference between absolute manifold and ambient pressure at which said sensing or set means will permit conduction or nonconduction through said switch means, said contacts opening or closing in response to said ambient pressure achieving said preselected relationship to said manifold pressure, and signal processing circuit means including a sample-and-hold circuit adapted to receive a signal indicative of the opening or closing of said contacts, means for generating a MAP signal in response to the operation of said manifold absolute pressure sensor, said sample-and-hold circuit being enabled in response to said opening or closing of said switch to provide a signal indicative of said MAP signal, and means for receiving said signal indicative of said opening or closing of said switch means and said MAP signal for generating an AAP signal in response thereto.

## 4,388,826
## WEAPON SIMULATOR

Peter Mannhart, Hochdorf, and Bruno Ruppen, Zürich, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Sep. 23, 1981, Ser. No. 304,823
Claims priority, application Switzerland, Sep. 26, 1980, 7232/80
Int. Cl.³ G01N 19/00
U.S. Cl. 73—167 4 Claims

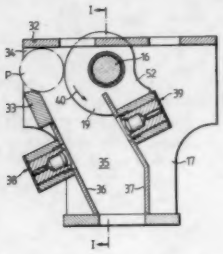
1. A weapon simulator for checking the removal of ammuni-

tion from a magazine at a cadence essentially corresponding to that with which an automatic firing weapon is fired, comprising:

a shaft arranged essentially parallel to the lengthwise axis of cartridges which are to be removed;

two cam disks secured in spaced relationship from one another upon said shaft;

said cam disks being structured such that during one revolution of the shaft together with both of the cam disks, said



cam disks conjointly cam-out of the magazine a cartridge transversely with respect to its lengthwise axis;

a drive motor for driving said shaft provided with said cam disks;

an infeed channel by means of which the cartridges are infed from the magazine to both of the cam disks; and

a withdrawal channel through which the cartridges are ejected by means of both cam disks at the required cadence.

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**4,388,827**

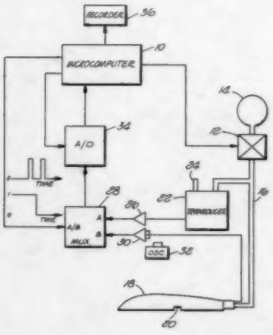
**METHOD FOR MEASURING THE DEPTH OF A LIQUID BODY**

**James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93401, and Charles E. Kinzer, 8530 San Andres, Atascadero, Calif. 93422**

**Filed Dec. 4, 1980, Ser. No. 212,940**

**Int. Cl.³ G01F *23/14***

**U.S. Cl. 73—302** **2 Claims**



**1**. A method for detecting the depth of a liquid body comprising the steps of:

(a) connecting a tube to a source of pressurized inert gas at its first end;

(b) locating the opposed end of said tube at substantially the bottom of said body of liquid;

(c) applying a plurality of pulses of pressurized gas of predetermined duration to said tube in a periodic manner by opening a valve in said tube for preselected periods of time; then

(d) measuring the pressure within said tube a predetermined time after each of said pulses to obtain a plurality of data points indicative of the pressure at the bottom of said body of water; then

(e) converting said pressure into a corresponding measure of the depth of said body of liquid.

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**4,388,828**

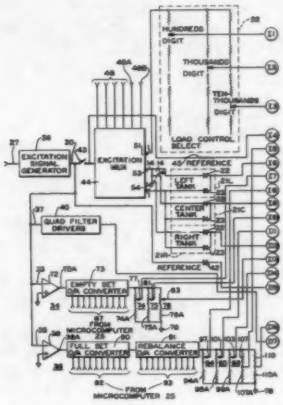
**LIQUID GAGING SYSTEM SENSOR CALIBRATION**

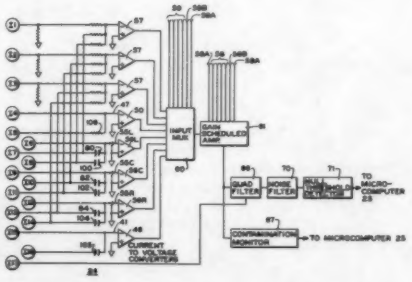
**William R. Dougherty, St. Anthony, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed May 14, 1980, Ser. No. 149,796**

**Int. Cl.³ G01F *23/26***

**U.S. Cl. 73—304 C** **22 Claims**





**1**. In a liquid gaging system, an apparatus for measuring and storing a value related to an unwetted capacitance of a capacitive sensor, the stored value being available for use in liquid measurements, comprising:

a capacitive sensor for mounting in a tank, the sensor having an unwetted capacitance variable in dependence on manufacturing tolerances, the sensor capacitance also being related to a stray capacitance in the system;

processor means having digital-to-analog converter means for automatically determining the sensor unwetted capacitance including the sensor capacitance contributed by the stray capacitance in the system, the processor means being connected to the sensor; and

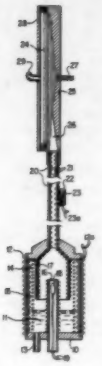
means for storing a value related to the sensor unwetted capacitance determined by the processor means, the means for storing being connected to the processor means.

**4,388,829**

## EVAPORATION TYPE BAROMETER

**Thomas M. Dauphinee, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada**

**Filed Oct. 5, 1981, Ser. No. 308,468**
**Int. Cl.³ G01L *7/08***
**U.S. Cl. 73—384** **9 Claims**



**1**. A barometer of the evaporation or hypsometer type comprising:

(a) an enclosed cylindrical bulb partially filled with a working fluid,

(b) a first temperature measuring device positioned in the bulb for measuring the temperature of the working fluid therein,

(c) a relatively thin extended tube connected to and extending from the bulb,

(d) a second temperature measuring device positioned on the tube at a position away from the bulb for measuring the temperature of the working fluid at that location,

(e) an electrical heater associated with the bulb for bringing the working fluid to the evaporation temperature,

(f) a mechanism for transmitting ambient pressure to the inside of the tube-bulb combination and preventing escape of working fluid connected to the upper end of the tube,

(g) electrical means connected to the heater for providing a heating current thereto,

(h) control means connected to the second temperature measuring device and the electrical means for controlling the level of heating current provided to the heater, and

(i) output means connected to the first temperature measuring device for providing an output voltage, said voltage being related to the ambient barometric pressure.

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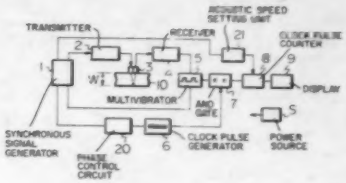
**4,388,830**

## METHOD AND APPARATUS FOR MEASUREMENT OF THICKNESS UTILIZING ULTRASONIC PULSES

**Isao Narushima, Machida, and Morio Nakano, Sagamihara, both of Japan, assignors to Teitsu Denshi Kenkyusho Co., Ltd., Kawasaki, Japan**

**Filed Jun. 17, 1981, Ser. No. 274,451**
**Claims priority, application Japan, Dec. 8, 1980, 55-172076**
**Int. Cl.³ G01N *29/00, 24/00*; G01H *5/00***
**U.S. Cl. 73—597** **11 Claims**

**4**. An apparatus for measuring the thickness of a workpiece comprising a probe for transmitting ultrasonic pulses into a workpiece and for receiving related ultrasonic echo pulses, a synchronizing signal generator, means responsive to said synchronizing signal generator for periodically supplying electric pulses to said probe to cause it to produce said ultrasonic pulses, means for measuring the period of time elapsed from the time of transmission of each ultrasonic pulse to the time to reception of its related echo pulse, a clock pulse generator, means for counting each of said measured time periods, means for counting the number of clock pulses within said measured time periods by the clock pulses supplied from said clock pulse generator, and means for deriving from each of such counted time periods and such counted clock pulses within said measured time periods a signal representing the thickness of the workpiece, characterized in that there is provided a phase




control circuit between said synchronizing signal generator and said clock pulse generator, said phase control circuit being adapted to shift the phase of said clock pulses by $2\pi/N$ radians where N is an integer not less than two in a preselected direction upon completion of each measurement of the elapsed time period during which N successive echo pulses are measured by said measuring means.

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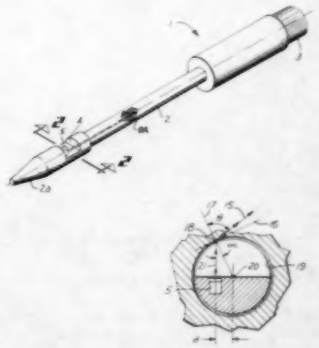
**4,388,831**

## ULTRASONIC PROBE FOR NONDESTRUCTIVE INSPECTION

**Ira N. Sherman, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Feb. 20, 1981, Ser. No. 236,086**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—623** **4 Claims**



**1**. An ultrasonic probe for nondestructive detection of anomalies in the region of a generally cylindrical hole comprising:

(a) an elongated shaft having a longitudinal axis;

(b) a first ultrasonic transducer which is

(i) mounted at a predetermined distance from the longitudinal axis on a lateral offset surface located on a lateral extension of the shaft, the lateral offset surface being

(A) located at an outer end section of the lateral extension,

(B) offset a distance determined by the expression

$$b = \left(\frac{D}{2}\right) - \sqrt{\left(\frac{D}{2}\right)^2 - a^2}$$

wherein:
b=offset distance
D=diameter of hole under inspection
a=the predetermined distance of (b)(i),

(ii) oriented for directing the axis of radiation of ultrasonic energy emanating therefrom opposite to the direction of offset and in a plane perpendicular to the longitudinal axis of (a),

(c) a second ultrasonic transducer which

(i) has a common focal length as the first ultrasonic transducer,

(ii) is mounted on the longitudinal axis of (a) and in a common plane with the first ultrasonic transducer, the plane being perpendicular to the longitudinal axis, and

(iii) is oriented for directing radiation radially outwardly of the longitudinal axis of (a).

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**4,388,832**

## METHOD AND APPARATUS FOR RECEIVING ULTRASONIC WAVES BY OPTICAL MEANS

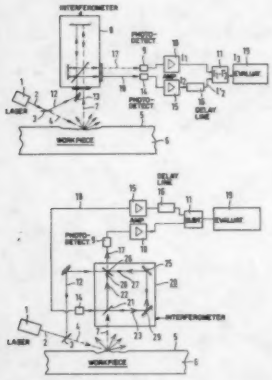
**Walter Kaule, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.**

**Filed Jul. 1, 1981, Ser. No. 279,606**

**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029776**

**Int. Cl.³ G01N *29/00***

**U.S. Cl. 73—655** **8 Claims**




1. The method of receiving ultrasonic waves from a workpiece by optical means wherein the ultrasonic waves are manifest as cyclic deformations occurring at a surface portion of the workpiece comprising:

providing a laser beam and causing it to be incident upon the surface portion to illuminate such portion;

transmitting the laser beam light reflected at said surface portion as a measuring beam to an optical interferometer and converting the optical signal responsive to said measuring beam after traversing said interferometer to a first electrical signal;

separating a portion from said laser beam before said beam is incident upon said workpiece surface portion;

transmitting said non-incident beam portion as a comparison beam to said optical interferometer and converting the optical signal responsive to said comparison beam after traversing said interferometer to a second electrical signal;

separately amplifying said first and said second eléctrical signals;

delaying said second amplified electrical signal;

subtracting said amplified and delayed second electrical signal from said amplified first electrical signal to provide a difference signal, and

evaluating said difference signal.

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**4,388,833**

## DIFFERENTIAL PRESSURE GAUGE

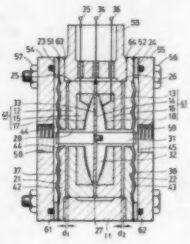
**Hideki Kuwayama, Tokyo, Japan, assignor to Kabushiki Kaisha Hokushin Denki Seisakusho, Tokyo, Japan**

**Filed Dec. 18, 1980, Ser. No. 217,594**

**Claims priority, application Japan, Jan. 7, 1980, 55-336[U]**

**Int. Cl.³ G01L *9/12***

**U.S. Cl. 73—718** **16 Claims**



1. A differential pressure gauge comprising:

a tubular body having a terminal box formed on the circumference thereof, said box being unitary with said tubular body and extending outwardly of said circumference;

a first plate-like member having a through hole therein, said first plate-like member being fixed to the tubular body to close one end of said body, said first plate-like member and said tubular body being provided with portions that abut one another in a plane perpendicular to the axis of said tubular body;

a second plate-like member fixed to the tubular body to close the other end thereof;

a displacement transducer fixedly mounted on the tubular body within a region defined by the tubular body and the first and second plate-like members, the opposing sides of said displacement transducer being disposed in facing relation respectively to surfaces of said first and second plate-like members and being spaced from said surfaces of said first and second plate-like members by intervening air gaps operative to assure that any deformation of either of said plate-like members is incapable of achieving contact between said surface of said plate-like member and the facing side of said transducer,

a first pressure receiving member mounted on the tubular body on the outside of the first plate-like member;

first pressure transmitting means for transmitting to the displacement transducer an external pressure received by the first pressure receiving member; and

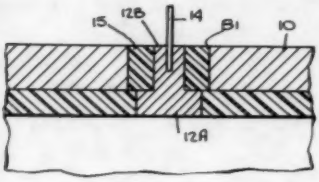
first limiting means for receiving by the first plate-like member a deflection of the first pressure receiving member in excess of a predetermined value caused by an overpressure from the outside, whereby the overpressure received by the first plate-like member is supported by the tubular body.

**4,388,834**

## ELECTROMAGNETIC FLOWMETER HAVING A MONOLITHIC CONDUIT

**Roy F. Schmoock, Yardley, Pa., assignor to Fischer & Porter Company, Warminster, Pa.**

**Filed Mar. 31, 1981, Ser. No. 249,484**
**Int. Cl.³ G01F 1/58**
**U.S. Cl. 73—861.12** **9 Claims**




**1.** A monolithic structure comprising at least one electrode pre-molded of flowable synthetic thermoplastic material having electrically conductive properties, said molded electrode having a periphery of predetermined shape and a layer molded about the periphery of the electrode and fused thereto, the layer being formed of a flowable synthetic thermoplastic material having an affinity for the electrode material and flowing about said periphery to be fused thereto, the layer material having electrical insulating properties.

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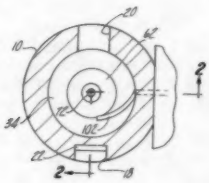
**4,388,835**

## FLUID FLOW METER

**Nils O. Rosaen, Clarkston, Mich., assignor to Universal Flow Monitors, Hazel Park, Mich.**

**Continuation-in-part of Ser. No. 67,444, Aug. 20, 1979, Pat. No. 4,282,761. This application Aug. 3, 1981, Ser. No. 289,290**
**Int. Cl.³ G01F 1/22**
**U.S. Cl. 73—861.58** **15 Claims**




**1.** A fluid flow meter comprising:

a housing having a fluid inlet and a fluid outlet,

fluid passage means formed through said housing for connecting said inlet with said outlet, said fluid passage means including an elongated housing chamber and means connecting one end of the chamber to the inlet and the other end of the chamber to the outlet,

a cartridge assembly self-aligning piston having an axial bore, axially slidably mounted in said chamber and movable between a first position and a second position, and insertable in said housing without disturbing piping,

means for resiliently urging said piston towards said first position,

means for fluidly sealing one end of said piston to said housing,

a plate having an orifice and means for securing said plate to said piston so that said orifice is open to said piston bore and so that one side of said plate is open to the inlet end of the chamber and the other side of the plate is open to the outlet end of the chamber,

a rod attached to said piston assembly and extending through said housing chamber, said rod having a tapered portion positioned through said plate orifice so that the area of the opening between the rod tapered portion and orifice increases as said piston moves from said first position and towards said second position,

means for indicating the axial position of said piston exteriorly of said housing; and

wherein said rod extends through a first bore in the other end of the piston, said first bore having a cross sectional area and shape substantially the same or slightly greater than the rod so that the rod guides said other end of the piston as said piston moves between said first and second position.

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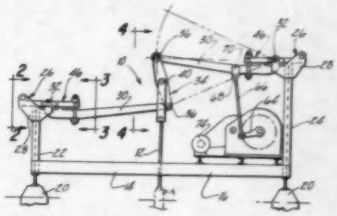
**4,388,836**

## PUMPING MECHANISM

**William D. Allison, 39 Randor Cir., Grosse Pointe Farms, Mich. 48236**

**Filed Jan. 26, 1981, Ser. No. 228,285**
**Int. Cl.³ F16H 21/32**
**U.S. Cl. 74—41** **8 Claims**



**1.** A mechanism for reciprocating loads vertically comprising: a base member, a load member supported relative to said base member for vertical reciprocating movement, a pair of arms supported on said base member for vertical swinging movement in a common plane, a link member having opposite ends pivotally connected to corresponding ends, respectively of said pair of arms for vertical translational movement, said load member being pivotally connected to said link member for movement therewith, a pair of hairpin torsion springs connected to each arm and to said base member to counter-balance said load member, each of said springs comprising a U-shaped member having a pair of generally parallel torsion bar leg members and foot portions extending in opposite directions from the free ends of said leg members, one foot portion of each of said springs of a pair of springs being anchored to each arm and the other foot portion of each pair of springs being anchored to said base with said U-shaped member of each pair of springs extending in opposite directions, and power means connected to one of said arms for oscillating said pair of arms in unison to reciprocate said lift member.

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**4,388,837**

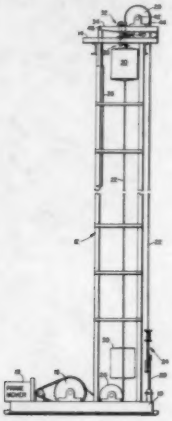
## POSITIVE ENGAGEMENT FAIL SAFE MECHANISM AND LIFT BELT CONSTRUCTION FOR LONG STROKE, WELL PUMPING UNIT

**Emil A. Bender, 6625 Kane Way, Bakersfield, Calif. 93309**

**Filed Jun. 28, 1982, Ser. No. 393,102**
**Int. Cl.³ F16H 27/02**
**U.S. Cl. 74—89.2** **10 Claims**

**1.** A long stroke, well pumping unit for a well pump including a conventional polish rod, rod string and sucker rod comprising: a base platform, a tower and the base platform, and a top platform surmounting the tower; rotatable drum means on the base platform and power means for rotating the drum means; a flexible lift belt attached at one end to the drum means and at its other end to the upper end of the polish rod of a well pump; a freely rotatable spool atop the top platform over which the lift belt is trained; a counterweight carried by the lift

belt; means for reversing the power means to thereby provide reciprocating movement to the lift belt and thus the polish rod, and self-energizing positive engagement fail safe means for terminating operation of the pumping unit in the event of failure by fracture of the lift belt, polish rod, rod string or sucker rod, comprising: a lever platform pivotally mounted on a generally horizontal axis on the top platform, the spool being rotatably mounted on the lever platform on an axis generally parallel to the lever platform pivotal axis, in a vertical plane located forwardly, toward the polish rod, of a vertical plane drawn through the lever platform pivotal axis, the lever platform having a second counterweight suspended therefrom at a point substantially rearwardly of both the spool axis and the lever platform pivotal axis, stationary brake means mounted on



the top platform adjacent the lift belt, on one side thereof, movable brake means pivotally suspended from the lever platform adjacent the lift belt, on a side thereof opposite the stationary brake means, and means mounted on the top platform adjacent the movable brake means for causing movement of the movable brake means towards the stationary brake means upon downward movement of the lever platform about its pivotal axis, whereupon failure by fracture of one of the well components as aforsaid or of the portion of the lift belt between the polish rod and the spool, the lever platform is caused to rotate about its pivotal axis in a direction away from the well head thus causing the movable brake means to descend, engage, and firmly trap the lift belt against the stationary brake means to thus terminate operation of the pumping unit.

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**4,388,838**

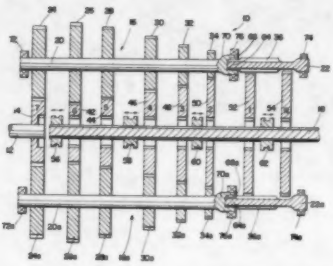
## MULTIPLE COUNTERSHAFT SIMPLE TRANSMISSION

**Elmer A. Richards, Kalamazoo, and Alan R. Davis, Plainwell, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Jul. 3, 1980, Ser. No. 165,833**
**Int. Cl.³ F16H *3/08, 3/02***
**U.S. Cl. 74—331** **12 Claims**

1. An improved simple change gear transmission of the type comprising an input shaft having an input gear thereon, a mainshaft, at least two substantially identical countershaft assemblies driven by said input gear, each of said countershaft assemblies comprising a countershaft having an axis of rotation substantially parallel to the axis of rotation of said mainshaft, each of said countershafts having a plurality of countershaft gears supported thereon for rotation therewith, a plurality of mainshaft gears surrounding said mainshaft and constantly meshed with one countershaft gear on each countershaft and clutch means for selectively clutching said mainshaft gears one at a time to said mainshaft, the improvement comprising:

each of said countershafts comprising a first portion and a second portion, said first and second portions of each of said countershafts drivingly engaged by a splined connection, said spline connection comprising a plurality of external spline teeth on one of said first and second portions and an equal number internal spline teeth on the other of said first and second portions, the number of spline teeth on each of said portions being evenly divisible into the number of countershaft gear teeth carried by any countershaft gear mounted on said first portion, each spline tooth of said plurality of spline teeth on said first portion having



the same circumferential alignment with respect to the countershaft gear teeth carried by said first portion as each (the) other spline tooth of said plurality of spline teeth on said first portion, the circumferential alignment of each of said countershaft gears carried by each of said second (portion) portions relative to the (splines) spline teeth on said second portion being substantially identical to the circumferential alignment of the corresponding countershaft gear carried by the other second portion relative to the (splines) spline teeth on the other second portion.

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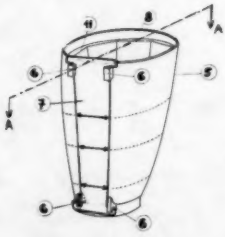
**4,388,839**

## DEVICE FOR THE ELABORATION, THE COMPOSITION, THE MIXING AND THE USE OF LIQUIDS, PRODUCTS OR INGREDIENTS

**Julien Benisti, 49, rue Youri Gagarine, Colombes, France (92700)**

**PCT No. PCT/FR80/00167, § 371 Date Jul. 28, 1981, § 102(e) Date Jul. 28, 1981, PCT Pub. No. WO81/01504, PCT Pub. Date Jun. 11, 1981**
**PCT Filed Nov. 26, 1980, Ser. No. 287,713**
**Claims priority, application France, Nov. 28, 1979, 79 29281**
**Int. Cl.³ G01F *19/00***
**U.S. Cl. 73—428** **7 Claims**



1. A portable device for receiving a liquid volume, comprising a vessel having a lateral wall, means arranged for removably retaining an interchangeable indication-bearing card against the outer surface of said vessel which is of transparent

material at least in the portion thereof receiving said card, wherein said vessel wall has a circular external cross-section and a polygonal internal cross-section for constituting magnifying lenses improving accuracy in the reading of the liquid level.

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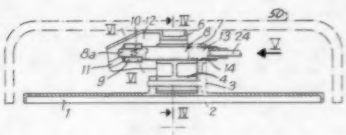
**4,388,840**

## CONTROL DEVICE FOR CONTROLLING AN OUTSIDE REARVIEW MIRROR FROM INSIDE A VEHICLE

**Stephane Manzoni, 1, rue Pasteur, Saint Claude, France (39200)**

**Filed May 1, 1980, Ser. No. 145,702**
**Claims priority, application France, May 16, 1979, 79 12494**
**Int. Cl.³ F16C *1/10***
**U.S. Cl. 74—501 M** **5 Claims**



1. A control device for controlling an outside rearview mirror from inside a vehicle, comprising:

a casing adapted to be secured to the vehicle and having a base;

a mirror supporting member;

a collar attached to the base of the casing;

a cross-piece for pivotally mounting said mirror supporting member about a first axis, said cross-piece being pivotally mounted on said collar about a second axis which is perpendicular to said first axis, said cross-piece including a bore, said collar further including parallel faces which are perpendicular to said second axis, said parallel faces including inclined grooves;

an operating member for controlling movement of said outside rearview mirror; and

a shaft mounted for rotational and axially sliding movement in said bore, one end of said shaft being attached to said operating member and the other end of said shaft including a pivotally mounted slide having two lugs adapted for movement in said inclined grooves of said parallel faces, said shaft including means cooperating with the mirror supporting member and adapted to be rotationally driven about said first axis when said shaft is rotationally moved in said bore.

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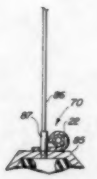
**4,388,841**

## LOAD BALANCING DEVICE

**Christopher L. Gamble, 2040 E. Howe, Tempe, Ariz. 85281**

**Filed May 27, 1980, Ser. No. 153,166**
**Int. Cl.³ F16F *15/22***
**U.S. Cl. 74—573 F** **2 Claims**



1. A load balancing device installable on a rotating rim carried on radial spokes, said load balancing device comprising:

(a) an annular tubular body member defining an annular interior chamber;

(b) a fluid load balancing mass moveable within said chamber in response to centrifugal force to oppose unbalanced forces; and

(c) universal bracket means, said bracket means including an arm portion which at least partially circles said annular tubular body and an attachment portion including a flange defining a slot engageable about selected of said spokes and closure means for securing said spoke in said slot for securing the tubular body to said rotating member.

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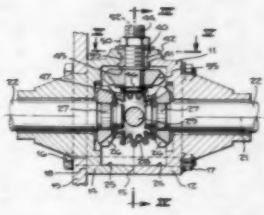
**4,388,842**

## LOCKING DEVICE FOR A DIFFERENTIAL MECHANISM

**Gerald V. Marcell, Costa Mesa, Calif., assignor to Kawasaki Motors Corp., Santa Ana, Calif.**

**Filed Jul. 1, 1980, Ser. No. 165,223**
**Int. Cl.³ F16H *1/44***
**U.S. Cl. 74—710.5** **5 Claims**



2. Locking device for a differential mechanism having a coaxial pair of sun pinion gears on a first axis meshed with a pair of side planetary gears on a second axis normal to the first axis and a driving means including a revolving gear housing enclosing said pairs of sun pinion and planetary gears, comprising, in combination therewith:

a locking gear mounted on said housing for reciprocal movement along a third axis perpendicular to the axes of said side and sun pinion gears;

said locking gear lockingly engaging said pairs of side planetary and sun pinion gears in one position to prevent differential operation thereof;

means for mounting said locking gear comprising a threaded fitting on said housing, a threaded shaft carrying said locking gear and engaged with said threaded fitting, and means for turning said shaft to engage and disengage the locking gear with said side planetary and sun pinion gears.

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**4,388,843**

## AUXILIARY TRANSMISSION NEUTRAL POSITIONING AND LOCKING CONTROL AND MECHANISM

**Terry E. Teeter, Mattawan, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Nov. 21, 1980, Ser. No. 208,962**
**Int. Cl.³ F16H *3/08*; B60K *41/00*; G05G *9/04***
**U.S. Cl. 74—745** **20 Claims**

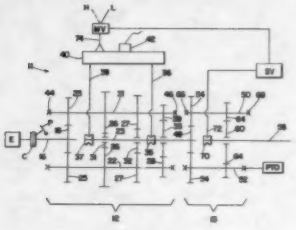
1. A compound change gear transmission comprising a change gear main transmission section connected in series with a change gear auxiliary transmission section;

said main transmission section comprising a main transmission input shaft, a main transmission output shaft and a main transmission shift control for selectively disengaging said main transmission output shaft from said main transmission input shaft and for selectively, drivingly engaging said main transmission input shaft to said main transmission output shaft through one of a plurality of selectively engageable gear ratios;

said auxiliary transmission section comprising an auxiliary transmission input driven by said main transmission output shaft, at least one auxiliary transmission countershaft constantly driven by said auxiliary transmission input, an

auxiliary transmission output shaft, a plurality of gears associated with said auxiliary countershaft and said auxiliary output shaft, an auxiliary shift control for drivingly connecting said auxiliary transmission output shaft to said auxiliary transmission input through one of a plurality of selective ratios, said auxiliary shift control comprising a shift fork shiftable to a first axial position to drivingly engage said auxiliary transmission output shaft with said auxiliary transmission input at a first selectable ratio and to a second axial position to drivingly engage said auxiliary transmission output shaft with said auxiliary transmission input at a second selectable ratio; and

an auxiliary transmission disengagement control having a first position for selectively positioning and locking said



auxiliary transmission shift control shift fork in a third axial position axially interposed said first and second axial positions whereat said auxiliary transmission output shaft is drivingly disengaged from said auxiliary input, said disengagement control having a second position allowing said auxiliary transmission shift control to drivingly engage said auxiliary output shaft to said auxiliary input shaft, said disengagement control, once positioned in said first position, effective to prevent engagement of said auxiliary transmission output shaft with said auxiliary transmission input until said disengagement control is positioned in said second position simultaneously with said main transmission output shaft being disengaged from said main transmission input shaft.

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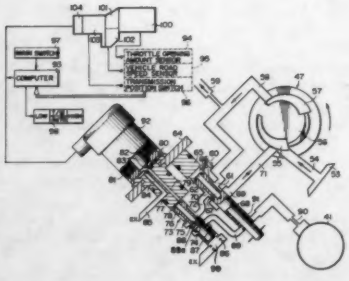
**4,388,844**

## TRANSMISSION FLUID PRESSURE CONTROL DEVICE WITH TWO STEPPED LINE PRESSURES

**Hajime Arai, Aichi, and Shoji Haga, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Oct. 3, 1980, Ser. No. 193,441**
**Claims priority, application Japan, Nov. 5, 1979, 54-143754**
**Int. Cl.³ F16H *5/64;* B60K *41/04***
**U.S. Cl. 74—752 C** **5 Claims**



**1.** For a transmission which comprises a hydraulic fluid pump and a hydraulic actuator and which is selectively shifted between speed stages according to selective supply of hydraulic fluid pressure to said hydraulic actuator:

a hydraulic fluid pressure control system, comprising:

(a) a line pressure regulation valve, which receives a supply of hydraulic fluid pressure from said hydraulic fluid pump, and which produces a regulated line hydraulic fluid pressure; and

(b) a switching valve, comprising a pilot port, which receives a supply of said line hydraulic fluid pressure, and which selectively supplies said line hydraulic fluid pressure as an operating pressure to said hydraulic actuator according to the opening and closing of said pilot port;

(c) said operating pressure, when thus provided by said switching valve, being also supplied to said line pressure regulation valve and increasing the regulated value of said line hydraulic fluid pressure;

(d) whereby, when operating hydraulic fluid pressure is not being provided to said hydraulic actuator, the value of said line hydraulic fluid pressure is maintained at a predetermined lower level; but, when operating hydraulic fluid pressure is being provided to said hydraulic actuator, the value of said line hydraulic fluid pressure is maintained at a predetermined higher level; and thus

(e) whereby load on said hydraulic fluid pump, when said operating pressure is not required to be provided to said hydraulic actuator, is low.

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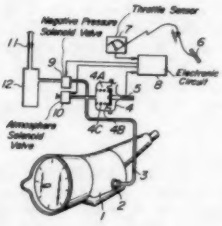
**4,388,845**

## LINE PRESSURE CONTROL DEVICE OF AN AUTOMATIC TRANSMISSION

**Norimasa Kishi, Yokosuka, and Shigeaki Yamamuro, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Apr. 1, 1980, Ser. No. 136,337**
**Claims priority, application Japan, Apr. 5, 1979, 54-41345**
**Int. Cl.³ B60K *41/04***
**U.S. Cl. 74—862** **6 Claims**




**1.** In an automotive vehicle having an engine and an automatic transmission coupled to said engine, said automatic transmission having a plurality of friction elements selectively actuated to effect speed changes in said transmission and hydraulic means hydraulically connected to said friction elements for applying fluid under pressure to said friction elements, an engine load sensor operatively associated with said engine for generating a signal corresponding to the load on said engine, a line pressure adjusting valve operatively associated with said hydraulic means for controlling the pressure of the fluid applied to said friction elements, a hydraulic pressure adjusting valve operatively associated with said line pressure adjusting valve and with said engine load sensor for producing a controlled pressure acting on the line pressure adjusting valve and adjusting the pressure of the fluid applied to said friction elements to a value corresponding to the engine load through the line pressure adjusting valve, the improvement comprising:

circuit means connected to said engine load sensor for generat-

ing a target line pressure signal in response to and corresponding to the load signal generated by the engine load sensor, a line pressure sensor operatively associated with said hydraulic means for generating an actually measured line pressure signal corresponding to the pressure of the fluid applied to said friction elements, a converter means connected to at least one of said circuit means and said line pressure sensor for converting at least one of the target line pressure signal and the actually measured line pressure signal into an upper limit line pressure signal greater than said one of said line pressure signals by a given amount and into a lower limit line pressure signal less than said one of said line pressure signals by a given amount, and a decision circuit means connected to said converter means and to said hydraulic pressure adjusting valve for comparing the upper and lower limit line pressure signals with the other of the target line pressure signal and the actually measured line pressure signal and driving and controlling the hydraulic pressure adjusting valve in accordance with the result of the comparison.

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**4,388,846**

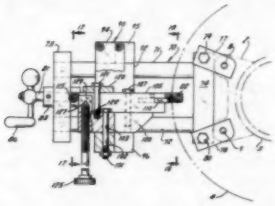
## FIXTURE FOR RESURFACING VEHICLE BRAKE DISCS

**William L. Kopecko, P.O. Box 183; Robert L. Fuller, 309 Alban St., and Joseph O. Duchac, Rte. 6, all of Rhinelander, Wis. 54501**

**Continuation-in-part of Ser. No. 171,312, Jul. 23, 1980, Pat. No. 4,336,730. This application Nov. 10, 1981, Ser. No. 319,451**

**Int. Cl.³ B23B *5/04***

**U.S. Cl. 82—4 A** **8 Claims**



1. A resurfacing tool fixture for simultaneously resurfacing both of the opposite sides of a brake disc for a vehicle wheel without removing said disc from said vehicle but when said wheel has been removed, said vehicle having a caliper brake mount bracket adjacent said disc for removably mounting a caliper brake thereon, said fixture comprising a fixed frame having elongated guide means thereon, adjustable mounting means for rigidly and removably mounting said frame on said caliper mount bracket when said caliper brake has been removed from said bracket, said adjustable mounting means including a pair of links connected between and to said fixed frame and said caliper mount bracket for accommodating different caliper mount brackets, a shiftable tool holder frame having means for being shiftably mounted on said fixed frame guide means, adjustable positioning means connected between said fixed frame and said shiftable frame for shifting the latter relative to said fixed frame and said disc, said shiftable frame having a pair of cutting tools carried by said shiftable tool holder frame and locatable one on each side of said disc for simultaneous cutting contact with opposite sides of said disc as said shiftable frame is shifted on said fixed frame guide means by actuation of said adjustable positioning means.

**4,388,847**

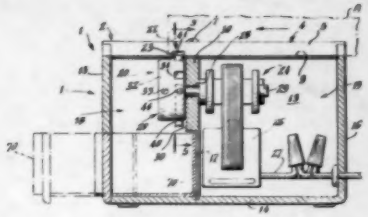
## ENVELOPE OPENER

**Oscar W. Stoeckli, 2 Hughes Ave., Rye, N.Y. 10580**

**Filed Sep. 24, 1980, Ser. No. 190,199**

**Int. Cl.³ B26D *5/20***

**U.S. Cl. 83—356.3** **20 Claims**



1. An envelope opener comprising means for guiding an envelope moved on the edge thereof along a path aligned with said edge into and through a cutting zone disposed across said path; an anvil member presenting in said zone a surface having an edge to support a side of the envelope border at a location spaced slightly away from said envelope edge; a rotary cutter having mounted thereon at least one knife presenting a cutting edge rotatable by said cutter across said anvil edge from the other side of said border, each said cutting edge coacting with said anvil member in a revolution of said cutter to slice off a narrow elongate segment of said border in said zone, each said cutting edge having at least one leading point with cutting edge portions extending therefrom oriented so that said leading point first pierces the border of said envelope inward of the edge thereof than one of said extending cutting edge portions being oriented to slice said border on a cut line extending across the border and another of said extending cutting edge portions being oriented to slice the border on a cut line extending along said envelope edge; and means for rotating said cutter at a speed sufficient for said cutting edge or edges to remove substantially the entire envelope edge by slicing off such segments successively as the envelope is passed through said zone.

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**4,388,848**

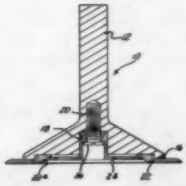
## CUTTER RING AND METHOD OF MAKING SAME

**Eugene V. Albert, Sedgwick County, Kans., assignor to Q Corporation, Sedgwick County, Kans.**

**Filed May 4, 1981, Ser. No. 260,055**

**Int. Cl.³ B26D *1/14, 7/26***

**U.S. Cl. 83—666** **11 Claims**



1. A cutter ring for use in trimming printed circuit board leads and adapted to be held within an arbor by a retainer, said cutter ring comprising:

a cutter member having a central hub portion surrounding an aperture,

said cutter member being characterized by being formed

from a hardened material which can only be shaped through a prolonged grinding operation; and

a molded cap formed over said hub portion to present a surface to be received within said arbor,

said molded cap being characterized by being formed from a relatively workable material which can be shaped through a machining operation,

whereby said molded cap may be machined to the configuration of said arbor.

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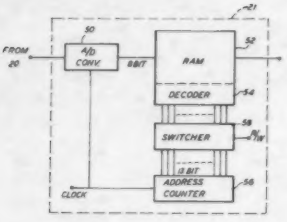
**4,388,849**

## SIGNAL PROCESSING SYSTEM

**Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Feb. 8, 1980, Ser. No. 119,642**
**Int. Cl.³ G10H *3/06***
**U.S. Cl. 84—1.18** **9 Claims**




1. A music signal processing system comprising:

an original music signal having a given frequency;

means for deriving pulse signals arranged in pulse signal groups ($S_{1\text{-}1}$, $S_{1\text{-}2}$, . . . $S_{1\text{-}M}$), ($S_{2\text{-}1}$, $S_{2\text{-}2}$, . . . $S_{2\text{-}M}$), . . . ($S_{m\text{-}1}$, $S_{m\text{-}2}$, . . . $S_{m\text{-}M}$) by selecting a given sampling period Tn for the original music signal such that an integer multiple number of the music frequency cycles occurs during each sampling period, and by sampling the signal in each sampling period Tn at every timing tm which defines a sampling frequency f where f is at least twice the given frequency of the music signal and wherein the timings tm are synchronized with the music signal sampling periods Tn, where for $S_{m\text{-}M}$, m represents one of the sampling periods Tn during which sampling is occurring and M represents one of the timings tm during one of the sampling periods Tn when sampling is occurring; and

means for obtaining a series of rearranged pulse row signal groups $P_1$, $P_2$ . . . $P_m$ by rearranging said pulse signals obtained at every timing tm in the order of ($S_{1\text{-}1}$, $S_{2\text{-}1}$, . . . $S_{m\text{-}1}$)($S_{1\text{-}2}$, $S_{2\text{-}2}$, . . . $S_{m\text{-}2}$) . . . ($S_{1\text{-}m}$, $S_{2\text{-}m}$, . . . $S_{m\text{-}M}$) respectively corresponding to said pulse row signal groups $P_1$, $P_2$, . . . $P_m$.

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**4,388,850**

## MULTIPLE OCTAVE GENERATOR TUNING SYSTEM

**Dale M. Uetrecht, Colerain Township, Hamilton County, Ohio, assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio**

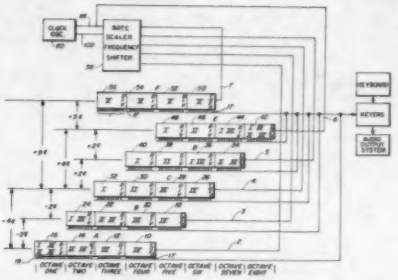
**Continuation of Ser. No. 832,353, Sep. 12, 1977. This application Apr. 14, 1980, Ser. No. 139,643**
**Int. Cl.³ G10H *1/02***
**U.S. Cl. 84—1.24** **4 Claims**

1. In an electronic organ having at least one keyboard and an audio output system, an improved celeste generator system comprising:

at least two locked multiple octave ensemble generator ranks which produce non-identical ranges of tone signals varying from standard musical frequencies by a substantially constant percentage across each rank;

an additional single locked multiple octave celeste generator rank tuned at least five cents higher in frequency than said ensemble generator ranks and which produces a range of tone signals over more than three octaves which vary from standard musical frequencies by a substantially constant percentage across the entire range;

a first stretched generator group comprising multiple unlocked octaves selected on an octave by octave basis only from more than one of the ensemble generator ranks and which produces tone signals having frequencies which vary from standard musical frequencies in a manner such that an overall stretched inter-octave tuning effect is created within the group;




a second stretched generator group comprising multiple unlocked octaves selected on an octave by octave basis only from more than one of the ensemble generator ranks and which produces tone signals having frequencies which vary from standard musical frequencies in a manner such that an overall stretched inter-octave tuning effect is created within the group;

whereby operation of the keyboard causes selection of corresponding tone signals simultaneously from the celeste generator rank and one or more of the stretched generator groups to produce one or more celeste voices via the audio output system.

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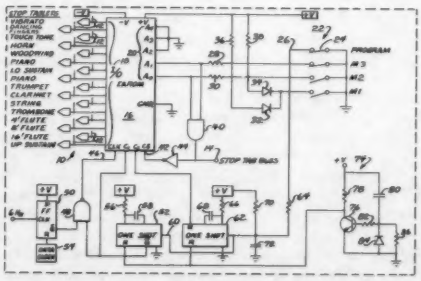
**4,388,851**

## NON-VOLATILE MEMORY SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

**William R. Hoskinson, Elburn; Joseph C. Carley, Sycamore, and Anthony C. Ippolito, DeKalb, all of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.**

**Filed Sep. 24, 1980, Ser. No. 190,215**
**Int. Cl.³ G10H *1/02***
**U.S. Cl. 84—1.24** **6 Claims**




1. A memory system for an electronic musical instrument having a plurality of player actuatable instrument control means, comprising: an EAROM readable, writable memory means having a predetermined number of multibit words and including addressing input means, data input/output means,

and erase/write control input means, said data input/output means being coupled with at least selected ones of said plurality of player actuatable instrument control means, for inserting manually determined combinations of said control means respectively in said memory means words, and a single manually operable means connected to said erase/write control input means for erasing only a single word from said memory means and immediately thereafter writing in a new word as a result of a single operation of said manually operable means, and player actuatable memory control means for selecting one of said multibit words of said memory means and said selected ones of said player actuatable instrument control means for erasing and rewriting with selected one of said multibit words.

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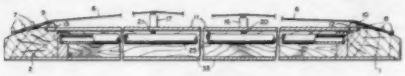
**4,388,852**

## DULCIMER CONSTRUCTION

**Roderick L. Cramer, c/o The Beriyth Co., P.O. Box 330, 1035 N. Fourth St., Wytheville, Va. 24382**

**Filed Aug. 13, 1981, Ser. No. 292,661**
**Int. Cl.³ G10D *3/00***
**U.S. Cl. 84—284** **3 Claims**



1. In a dulcimer comprising two divergent pin blocks, two side rails connecting the ends of one pin block to the corresponding ends of the other pin block, a back panel secured around its periphery to both pin blocks and both side rails, anchor pins in one pin block, turning pins in the other pin block, and tuned strings under substantial tension running from anchor pins to tuning pins, the improvement comprising a plurality of metal braces running from pin block to pin block parallel to the strings and out of contact with the back panel, an anti-rotational fastening structure at each end of each side rail whereby each pin block is held against uupward and inward rotation under influence of string tension, a floating sounding board with opposite ends supported in recesses in the upper inner edge of the pin blocks, two bridge rails over said board supporting the strings and holding the board in the recesses, two rows of bridge blocks supporting the strings atop the board and intermediate the bridge rails, and two rods, one beneath each of said rows, each with its top surface in contact with the board and carried by the braces.

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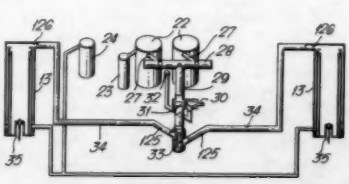
**4,388,853**

## MISSILE LAUNCHERS

**Denis Griffin, Guildford, and John F. Adie, Great Bookham, both of England, assignors to Frazer-Nash Limited, Kingston-Upon-Thames, England**

**Filed Jul. 24, 1980, Ser. No. 178,255**
**Int. Cl.³ B64D *1/02***
**U.S. Cl. 89—1.5 F** **25 Claims**



25. A missile launcher provided with gas-pressure-actuated fore and aft ejection rams and a choked flow gas system comprising:

breech chambers for receiving gas cartridges,

a gas manifold,

a choked flow device located between said breech chambers and said gas manifold,

a common gas flow channel and

fore and aft gas flow ducts extending from said common gas flow channel to the fore and aft rejection rams,

said common gas flow channel communicating with said manifold.

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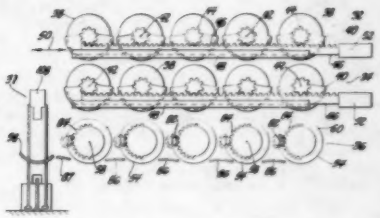
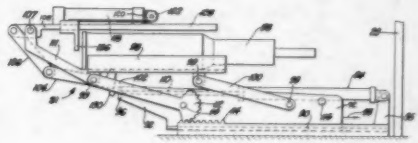
**4,388,854**

## AMMUNITION STORAGE AND TRANSFER MECHANISM

**Joseph M. Dabrowski, Oakland County; Valentine P. Dauhar, Wayne County; Richard H. Fryer, Oakland County; John Geraltowski; James R. Underwood, both of Macomb County; Roger K. Waid, and Jaunutis B. Gilvydis, both of Oakland County, all of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Feb. 26, 1981, Ser. No. 238,313**
**Int. Cl.³ F41F *9/06***
**U.S. Cl. 89—46** **7 Claims**





1. In a military tank having a turret movable in the azimuth plane, a gun mounted in the frontal area of the turret for movement in the elevational plane, and magazine means for storing ammunition within the turret in rearwardly spaced relationship to the gun; the improvement wherein said magazine means comprises two individual magazines, each arranged to support rounds of ammunition in prone attitudes generally parallel to the gun axis when said gun is at a zero elevational setting; each magazine including first means for supporting a number of rounds of ammunition in an upper row configuration, second means for supporting a number of rounds of ammunition in an intermediate row configuration, and third means for supporting a number of rounds of ammunition in a lower row configuration; the individual magazines being spaced laterally from a vertical plane coincident with the gun axis to provide an ammunition loader space between the magazines; and an ammunition loader disposed in the space between the magazines for transferring an individual round of ammunition into the gun firing chamber; the support means for the upper and intermediate rows of ammunition in each magazine comprising a series of trays normally facing upwardly to receive prone rounds from the superjacent spaces above the individual trays; each tray being rotatable around a horizontal axis generally coincident with the axis of the supported round, whereby one hun-

dred eighty degree motion of an individual tray causes a supported round of ammunition to be gravitationally discharged to the space directly below the tray.

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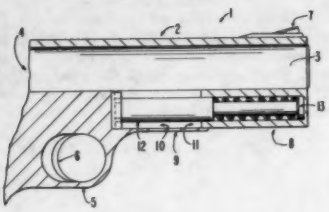
**4,388,855**

## FIREARM PNEUMATIC SLIDE DECELERATOR ASSEMBLY

**Paul J. Sokolovsky, 641 Torrington Dr., Sunnyvale, Calif. 94087**

**Filed Oct. 6, 1980, Ser. No. 194,680**
**Int. Cl.³ F41D *11/12***
**U.S. Cl. 89—198** **5 Claims**



**1**. A slide decelerator assembly for a firearm having a slide which moves when said firearm is fired comprising:

a cylinder for containing compressed air;

a piston assembly including a hollow tubular member having an open end and a closed end, means forming a first air passageway in said closed end, a base member, means forming a second air passageway in said base member for communication with said first air passageway, and means for movably mounting said base member to said closed end of said hollow tubular member for adjusting the compressing of air in said cylinder in response to said slide movement.

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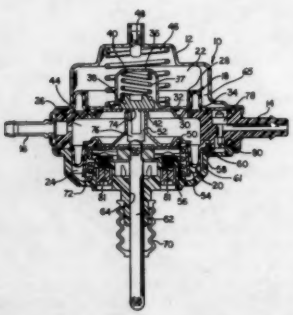
**4,388,856**

## IDLE SPEED CONTROL ACTUATOR

**John E. Cook, Chatham, Canada, assignor to Canadian Fram Limited, Canada**

**Filed Dec. 1, 1980, Ser. No. 211,617**
**Int. Cl.³ F15B *9/10*; F01B *19/00*; F16J *3/02***
**U.S. Cl. 91—49** **14 Claims**



**1**. In a vacuum actuator, a plunger and an actuating assembly for actuating said plunger, said actuating assembly comprising a housing, a control diaphragm and an actuating diaphragm dividing said housing into a first chamber between the control diaphragm and one end of the housing, a second chamber between the actuating diaphragm and the other end of the housing, and a third chamber between said diaphragms, vacuum communicating means for communicating vacuum into said first and second chambers, ambient air communicating means for communicating ambient air into said third chamber, passage means for communicating said second and third chambers, air control means controlled by said control diaphragm to control communication through said passage means, said plunger extending from said housing and being positioned by said actuating assembly in an actuating range between first and second actuated positions as a function of the level of the vacuum communicated into said actuating assembly, characterized in that said actuating assembly includes means for withdrawing said plunger to a retracted position when vacuum is not available to said vacuum communicating means.

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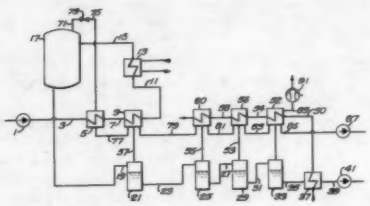
**4,388,857**

## APPARATUS FOR THE CONTINUOUS COOKING OF WORT

**Johannes Korek, Wieslock, Fed. Rep. of Germany, assignor to Kraftanlagen A.G., Heidelberg, Fed. Rep. of Germany**

**Filed Mar. 25, 1981, Ser. No. 247,335**
**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012591**
**Int. Cl.³ A23L *1/207***
**U.S. Cl. 99—276** **7 Claims**



**1**. An apparatus for continuous boiling of wort in beer production, comprising:

a reactor vessel under elevated pressure and at elevated temperature, and having a wort inlet conduit and a wort outlet conduit, a wort preheater in said inlet conduit, a boiler heated by outside heat and placed in said inlet conduit between said wort preheater and said reactor vessel, at least one evaporator in said outlet conduit, a vacuum evaporator with at least two evaporators in said outlet conduit following said at least one evaporator, at least two wort vapor condensers respectively connected to said at least two evaporators for receiving wort vapors therefrom, means for passing brew water, to be used in said beer production, through said at least two condensers and to be heated by the wort vapor condensating in said wort vapor condensers, and a wort cooler in said outlet conduit following said at least two evaporators, for cooling the boiled wort concentrated in said at least two evaporators.

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**4,388,858**

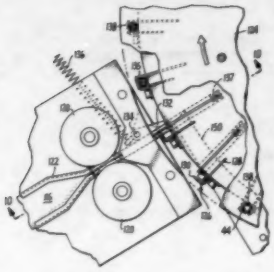
## MACHINE FOR PITTING AND STUFFING OLIVES

**John L. Margaroli, Oakland, and Frederick J. Cimperman, Castro Valley, both of Calif., assignors to Vistan Corporation, San Leandro, Calif.**

**Continuation of Ser. No. 923,376, Jul. 10, 1978, Pat. No. 4,220,080. This application May 9, 1979, Ser. No. 37,916**
**Int. Cl.³ A23N *4/08***
**U.S. Cl. 99—494** **5 Claims**

**1**. A machine for stuffing pitted olives comprising means to feed and fold a strip of stuffing material, means to cut stuffing pieces from said strip comprising a plate mounted for rotation, a strip cutting member fixedly carried by said plate comprising a first arm extending radially of said plate and a second arm extending tangentially of said plate terminating in a knife edge at its leading end, a pivotally and yieldingly mounted anvil

member disposed at one side of said folded strip in backup relation to the terminal end of said folded strip and in the path of movement of said strip cutting member and operable initially to support said strip to enable the cutting off of a stuffing piece by said knife edge and then to pivot out of the way of said knife edge as the latter moves by, a blade member slidably carried by said plate and movable radially with respect thereto



toward and away from said knife edge to, respectively, enclose a cut off stuffing piece as said anvil moves out of the path of said knife edge and to permit a stuffing piece to be cut off and positioned between said first and second arms and said plate, spring means to urge said blade member toward said knife edge, and means responsive to rotative movement of said plate to move said blade member away from said knife edge to permit the cutting off and pickup of a stuffing piece.

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**4,388,859**

## DEVICE FOR PICKLING PIECES OF MEAT

**Hans Sommer, Ziegelhütte, Limbach-Heidersbach D6951, Fed. Rep. of Germany**

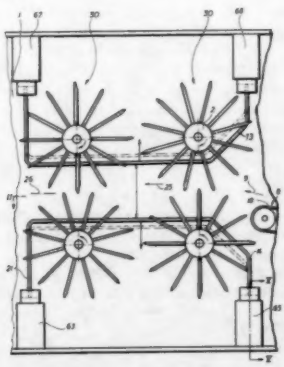
**PCT No. PCT/EP80/00035, § 371 Date Feb. 5, 1981, § 102(e) Date Jan. 29, 1981, PCT Pub. No. WO80/02635, PCT Pub. Date Dec. 11, 1980**

**PCT Filed Jun. 4, 1980, Ser. No. 232,027**

**Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922714; Dec. 19, 1979, 2951033; May 22, 1980, 3019483**

**Int. Cl.³ A23B *4/02, 4/14***

**U.S. Cl. 99—533** **14 Claims**



**1.** Device for pickling or curing pieces of meat in continuous operation, comprising a feeder for passing on meat along a given path in a transport direction, a housing, at least four hollow injection needle cylinders being disposed in said given path and having radially directed holes formed therein, a plurality of needles being partially movably disposed in said holes in said cylinders for stabbing and passing on meat, said needles being axially parallel to each other and having points spaced apart one behind the other in said transport direction and longitudinal holes formed in said needles and being closed off at said cylinders, a tube having radial holes formed therein being concentrically disposed within each of said cylinders and being fixed to said housing, said cylinders being rotatable on said tube and having an inside diameter which is smaller than the outside diameter of said tube forming a space therebetween, a brine tank connected to said tube for supplying pickling brine through said radial holes to said space under pressure, said tube having an outer surface with an axially-directed flat area formed thereon, said needles extending within said space, being in contact with said outer surface of said tube and having at least one additional hole formed therein in vicinity of said cylinders extending perpendicularly to and being in contact with said longitudinal hole, said perpendicular holes being in contact with said space for receiving brine when said needles are in contact with said flat area.

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**4,388,860**

## BELT PRESS WITH ENCLOSED HYDRAULIC ACTUATOR

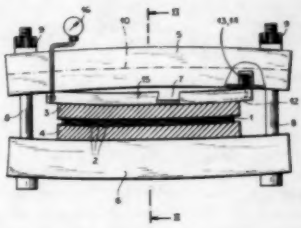
**Peter Thies, Ennepetal-Voerde, Fed. Rep. of Germany, assignor to Wagener Schwelm GmbH & Co., Schwelm, Fed. Rep. of Germany**

**Filed Dec. 2, 1981, Ser. No. 326,892**

**Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 8032251[U]**

**Int. Cl.³ B30B *15/06***

**U.S. Cl. 100—270** **12 Claims**



**1.** A belt press comprising:

at least one upper and at least one lower traverse respectively having lower and upper traverse faces, at least one of said traverses being formed of box section;

connecting means extending vertically between said upper and lower traverses and securing said lower traverse to said upper traverse;

upper and lower press platens carried on and between said traverses and having respective upper and lower platen faces respectively confronting said lower and upper traverse faces; and

hydraulic actuating means for displacing said platens toward each other and thereby pressing said platens against a belt engaged therebetween, said means being engaged between the traverse face of said one traverse and the confronting platen face and having

a U-section pressure plate having a base bearing on said confronting platen face and a pair of flanges extending toward said one traverse face,

at least one cushion forming at least one substantially closed chamber and lying between said flanges, said cushion bearing in one direction in surface contact on said pressure plate and in the opposite direction in surface contact at least indirectly on said face of said one traverse, and

means for pressurizing said chamber.

**4,388,861**

## BANK FOR ACCOMMODATING SEVERAL PRINT HAMMER UNITS

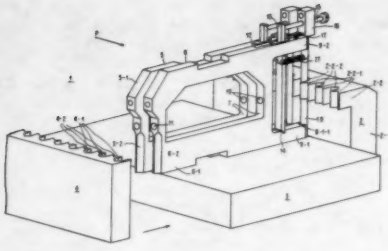
**Armin Bohg, Weil im Schönbuch, and Kurt Hartmann, Calw-Heumaden, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 21, 1981, Ser. No. 265,749**

**Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 80105617[U]**

**Int. Cl.³ B41J** *9/42*

**U.S. Cl. 101—93.02** **6 Claims**



1. A print hammer bank assembly comprising a plurality of individual print actuator units and a bank support for maintaining said plurality of actuator units removably stacked in a side by side relationship;

said actuator units each including

a thin, flat, rectangular frame member having front and rear sides defining front and rear vertical mounting edges,

said frame member having a central recess for carrying an electromagnetic operating means between said front and rear sides,

said front and rear sides of said frame member having guide holes therein,

a cylindrical impactor element slidable within said guide holes,

said inpactor element being movable by said operating means in a horizontal direction perpendicular with said front and rear mounting edges,

recoil damping means carried by said frame member along said rear vertical mounting edge, said recoil damping means being resilient in the direction perpendicular with said front and rear vertical mounting edges of said frame member; and

said bank support having a substantially U-shaped cross-section comprising a horizontal base connected between a front and a rear upright support plate,

said front upright support plate having fixed locating means for removably receiving and retaining said front vertical mounting edge of said frame member at an impact operating position,

said rear upright support plate having fixed locating means engaging said recoil damping means along said rear vertical mounting edge of said frame member for damping recoil transfer to said bank support.

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**4,388,862**

## APPARATUS FOR SILK SCREEN PRINTING

**Thomas A. Thomas, Jr., 4100 SW. 58th Ter., Davie, Fla. 33314**

**Filed Dec. 18, 1981, Ser. No. 332,254**

**Int. Cl.³ B41F** *15/20*

**U.S. Cl. 101—126** **3 Claims**

1. A screen printing device for T-shirts and the like comprising:

(a) support means including a table top;

(b) duct means extending forward from said table top and having an upper opening;

(c) flat perforated sheet means covering said duct opening;

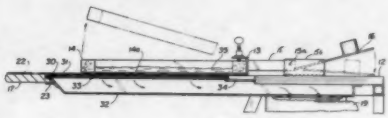
(d) vacuum means attached to said duct means;

(e) track means on the sides of said sheet means;

(f) a U-shaped shirt board slidable on said track means so as to surround three sides of the sheet means;

(g) a screen frame adapted to contain a printing screen;

(h) means to hold said screen frame in position so as to permit a printing screen to contact a T-shirt on said flat perforated sheet means; and



(i) means for controlling the time of operation of said vacuum means;

said device being so characterized that printing is done without a squeegee by timed operation of said vacuum means where an ink is used which cannot penetrate the screen openings by gravity alone.

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**4,388,863**

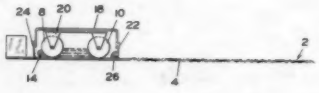
## SCRAPER BLADES USED WITH PRINT ROLLERS

**William D. De Santis, Lititz, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.**

**Filed Nov. 23, 1981, Ser. No. 323,941**

**Int. Cl.³ B41M** *1/12;* **B05D** *1/40, 1/28*

**U.S. Cl. 101—129** **1 Claim**



1. In a method for applying viscous materials to surfaces, and particularly for applying printing ink to the screen surface of a flatbed printer, reciprocating two spaced apart cylindrical print rollers, providing printing ink between the two rollers, providing a patterned screen below said rollers, reciprocating said rollers back and forth across the top of the screen to force printing ink through patterned areas of the screen, the improvement comprising the steps of:

(a) wiping accumulated ink from the top surface of the screen printer from the area behind the print rollers as they are moving in either direction across the screen to accumulate a supply of ink behind the trailing print roller and subsequently,

(b) using said accumulated ink as a supply of ink to the former trailing but now leading roller when the direction of travel is reversed to move in the opposite direction back across the print screen.

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**4,388,864**

## LITHOGRAPHIC DAMPENING SYSTEM

**Gordon R. Warner, Goleta, Calif., assignor to Warner "Autolitho" Corporation, Goleta, Calif.**

**Continuation-in-part of Ser. No. 968,384, Dec. 11, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 231,998**

**Int. Cl.³ B41L** *25/12, 25/14*

**U.S. Cl. 101—148** **6 Claims**

1. The method of continuously applying ink and water-concentrate to lithographic plates during a continuous printing run of a printing press having an ink fountain, comprising:

(a) continuously mixing separately supplied streams of ink, water and concentrate in a single fountain to form a finely dispersed mixture;

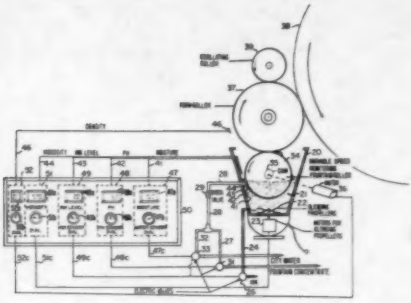
(b) continuously applying the mixture from the fountain to a lithographic plate through a single roller train;

(c) continuously flowing said separate streams of ink, water

and concentrate to the mixture to replace that consumed by the lithographic plate;

(d) continuously sensing the mixture in the fountain for indications of mixture ratios, and

(e) continuously utilizing the sensed responses for continuously regulating the flow of each of said ink, water and



concentrate streams to the mixture in said fountain to maintain a predetermined ratio of ink, water, and concentrate and to replenish that consumed during the printing run, thereby automatically maintaining a constant mix for roller train despite the changing rates of consumption of the various components during the print run and at different locations along the length of the ink train.

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**4,388,865**

## PRINTING LAYER OF URETHANE AND ACETYL POLYMERS AND METHOD OF MAKING

**Phillip R. Kellner, London, England, assignor to Crosfield Electronics Limited, London, England**

**Filed Mar. 10, 1981, Ser. No. 242,099**

**Claims priority, application United Kingdom, Mar. 11, 1980, 8008194**

**Int. Cl.³ B41C *1/02*; B29C *17/08***

**U.S. Cl. 101—401.1** **21 Claims**

1. A printing member having a print surface formed of a continuous layer of a composition consisting essentially of a blend of urethane and acetal polymers.

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**4,388,866**

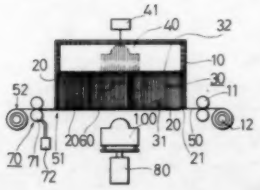
## METHOD OF PRINTING

**Motoyasu Nakanishi, Shimizushi, Japan, assignor to Suzuki Sogyo Kabushiki Kaisha and Kabushiki Kaisha Cubic Engineering, both of Shizuokaken, Japan**

**Filed Jan. 26, 1981, Ser. No. 228,702**

**Int. Cl.³ B44C *1/16***

**U.S. Cl. 101—426** **11 Claims**




4. A method of printing a material to be printed, which comprises:

providing a deformable layer of an assemblage of straight pins arranged parallel to each other to form an impression surface at one end of said assemblage, said pins being provided in a density to exert pressure on a water-expandable film when said film is placed in contact with said impression surface of said deformable layer,

placing said water-expandable film, having a pattern printed on said film, in contact with said impression surface of said deformable layer,

applying water to said film to cause said film to absorb water and become extended over said impression surface,

removing excess water from said film, and

contacting said extended film with a surface of the said material to be printed under pressure and forcing said material to be printed into said deformable layer, to cause the pins in contact with the surface through the film to be retracted so that the film is forced to closely contact said surface.

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**4,388,867**

## CIRCUIT ARRANGEMENT FOR A COMBINED PROXIMITY AND IMPACT FUSE

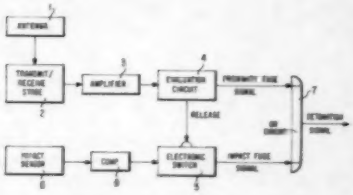
**Hans Baumer, Senden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 23, 1981, Ser. No. 246,698**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011231**

**Int. Cl.³ F42C *13/00***

**U.S. Cl. 102—211** **8 Claims**




1. In a combined proximity and impact fuze employed in a missile, a circuit arrangement for avoiding the actuation of a detonation upon impingement of the impact fuze on a rain drop comprising means connected to said proximity fuze and responsive to the signals produced by the same for preventing the generation of a detonation signal upon impact until recognition by said proximity fuze that a given release criterion for impact detonation has been met.

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**4,388,868**

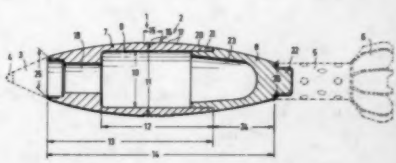
## SHELL BODY FOR FIN-STABILIZED PROJECTILES

**Amos Frostig, Haifa, Israel, assignor to Etablissement Salgad, Liechtenstein**

**Filed Nov. 10, 1980, Ser. No. 205,212**

**Int. Cl.³ F42B *13/02***

**U.S. Cl. 102—473** **10 Claims**



1. A shell body for fin-stabilized projectiles, said body having an ogival curvature and adapted to receive a headpiece containing a fuse at the front end thereof and to receive a tail tube with fin-stabilizer unit at the rear end thereof, said shell body comprising:

(a) a front body section and a rear body section slip fit joined to each other at a point approximately one-quarter of the

body length as measured from one end thereof starting at the beginning of the tail tube,

(b) an inner cylindrical bore is located within the front body section and has a surface unrestrictedly terminating at the rear of the frong body section to form an opening for receiving a charge,

(c) the rear body section includes an extension means which is complementary to and slidingly engages the cylindrical bore surface of the front body section.

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**4,388,869**

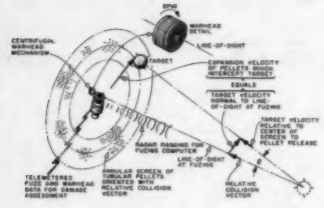
## ROTATING ROD WARHEAD

**Stuart K. Edleson, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 22, 1967, Ser. No. 626,655**

**Int. Cl.³ F42B *13/48***

**U.S. Cl. 102—494** **7 Claims**


SPIN
WARHEAD DETAIL
LINE-OF-SIGHT
TARGET
EXPANSION VELOCITY OF PELLETS NORMAL TO LINE-OF-SIGHT
EQUALS
TARGET VELOCITY NORMAL TO LINE-OF-SIGHT AT FUZING
TARGET VELOCITY RELATIVE TO CENTER OF SCREEN AT PELLET RELEASE
RADAR RANGING FOR FUZING COMPUTER
LINE-OF-SIGHT AT FUZING
RELATIVE COLLISION VECTOR
TELEMETERED FUZE AND WARHEAD DATA FOR DAMAGE ASSESSMENT
SIMULAR SCREEN OF TUBULAR PELLETS ORIENTED WITH RELATIVE COLLISION VECTOR

1. A rotating rod warhead for rapidly erecting an expanding screen of pellets in a uniform pattern, comprising:

(a) two similar housing units connected together to form a substantially cylindrical shaped housing assembly,

(b) a plurality of rod-shaped pellets retained within said cylindrical housing assembly for dispersing the pellets in a uniform pattern upon release thereof, said two housing units each having a circumferential retaining means thereabout for effectively retaining said pellets in a bundle within said housing parallel to each other and to the spin axis,

(c) pellets positioned about the outer circumference of said bundle of pellets being longer than the others and in the form of rocker type restraint beams which hold the other pellets in restraint at a point midway between the ends thereof to equalize any differential forces tending to perturb the pellets during spin-up and at release, the ends of the restraint beams having their ends held by said circumferential retaining means,

(d) drive means for spinning said housing assembly about its cylinder axis at a desired rotational speed for suitably dispersing said pellets upon their release,

(e) actuator means for quickly separating said two housing units and releasing said pellets.

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**4,388,870**

## BOWED PELLET PACK WARHEAD

**Stuart K. Edleson, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 26, 1968, Ser. No. 740,843**

**Int. Cl.³ F42B *13/48***

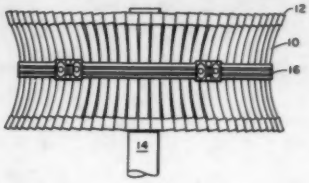
**U.S. Cl. 102—494** **4 Claims**

1. A rotating warhead for rapidly dispersing a plurality of pellets in a desired pattern without coning, comprising:

(a) a shaft, operable to be rotated at a desired speed, having a hub thereon,

(b) a substantially large number of elongated rod-shaped pellets assembled in a symmetrical bundle about said shaft hub,

(c) a releasable circumferential restraining means for compressing said pellets together and about said shaft hub in a touching relationship in the central plane of said symmetrical bundle normal to said shaft hub causing all said pellets to bow toward said shaft,




(d) said circumferential restraining means retaining said bundle of pellets about said shaft hub to be rotated therewith until released for rapid dispersion.

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**4,388,871**

## SPEED CONTROL SYSTEM FOR A PIPELINE INSPECTION VEHICLE

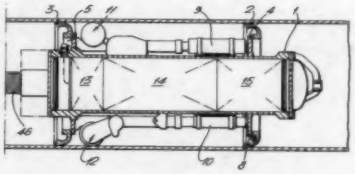
**John C. Braithwaite, Ponteland, and Ian Smith, Ashington, both of England, assignors to British Gas Corporation, London, England**

**Division of Ser. No. 182,658, Aug. 29, 1980, which is a continuation of Ser. No. 928,408, Jul. 27, 1978, abandoned. This application Jul. 24, 1981, Ser. No. 286,533**

**Claims priority, application United Kingdom, Jul. 27, 1977, 3150/77**

**Int. Cl.³ B65G *51/20***

**U.S. Cl. 104—138 G** **3 Claims**




1. A method of detecting flaws in a pipeline which comprises positioning an inspection vehicle which has flaw-detecting sensors and brake pads in said pipeline,

passing a fluid through said pipeline to cause said inspection vehicle to move therealong,

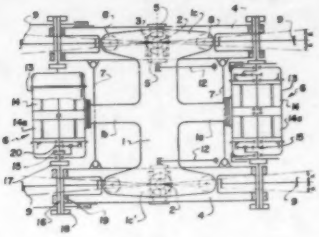
causing the brake pads of the inspection vehicle to contact the inner wall of the pipeline with a varying pressure so as to superimpose a varying continuous tractive (drag) resistance on the operationally induced tractive resistance to the vehicle and thereby maintain the total tractive resistance of the vehicle approximately constant such that the vehicle moves at a speed substantially equal to the average flow velocity of the fluid in the pipeline.

4,388,872

## RAILWAY CAR BOGIE CONSTRUCTION

Hansjochen Girod, and Gerhard Korn, both of Mülheim, Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,551
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936771
Int. Cl.³ B61C 9/44, 9/48
U.S. Cl. 105—99 4 Claims



1. A bogie for rail cars, comprising:
a traverse having two spaced-apart support pins depending therefrom and formed integrally therewith;
a half bogie on each side of and below said traverse;
each half bogie having a support box into which one of said pins extends;
a pair of bolts connected to each half bogie and extending into each support box, each pair of bolts engaging one of said pins for horizontal pivotal motion and vertical pivotal motion of each of said support boxes and half bogies with respect to each of said pins and said traverse;
a tie bar interconnecting said half bogies on respective opposite sides of said traverse;
a wheel having an axle rotatably supported adjacent each end of each bogie;
spring means disposed between said traverse and each of said half bogies at spaced locations on each side of each of said pins for facilitating spring support of said traverse by said half bogies and said wheels;
said traverse having a central portion extending between said half bogies; and
a drive motor connected at each end of said central portion of said traverse for driving said wheels, each drive motor including two mutually independent runners, a slide flange mounted planetary gear arranged on each side of said drive motor and driven by said runners, a cardan shaft, said wheels each having an axle connected to one cardan shaft, each cardan shaft being pivotal to one of said half bogies and adjustable in length.

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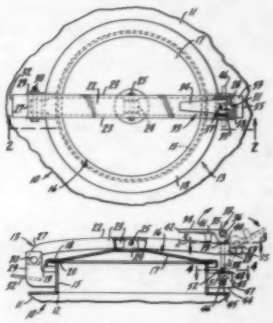
4,388,873

## RAILROAD VEHICLE

John V. Carleton, Lansing, Ill., and Nick Nenadic, East Chicago, Ind., assignors to Union Tank Car, East Chicago, Ind.

Filed Apr. 30, 1981, Ser. No. 259,279
Int. Cl.³ B61D 7/12, 39/00; B65D 45/24
U.S. Cl. 105—377 6 Claims

1. A hatch for a vessel holding a commodity under pressure, comprising:
A. a ring having an upper surface surrounding an opening through said vessel, said ring extending upwardly beyond the upper surface of said vessel;
B. a hatch cover above said ring having an underside for closing said opening, gasket means sealing the underside of said cover against the upper surface of said ring;
C. an elongated handle attached to the top of said cover, opposite ends of said handle projecting beyond the periphery of said cover, hinge means connecting one end of said handle to said ring so that said cover is pivotable toward and away from said ring to close and open said hatch, there being a longitudinal slot in the other end of said handle;
D. means for latching said cover in closed position against said ring comprising a cam lever having one end pivotally attached to one end of a connecting link, means attaching the other end of said link to said ring in such a manner that said link is pivotable toward and away from said handle longitudinally of said handle and in such a manner that said link is movable transversely of said handle, said link being receivable in said slot in said handle, a cam surface on an underside of said lever for bearing against an upper surface of said handle adjacent said slot when said link is received in said slot and said lever is pivoted toward said handle, whereby said link is tensioned so as to hold said cover in closed position; and
E. means for venting pressure in said vessel and preventing



sudden opening of said cover, comprising a safety catch projecting beyond said other end of said handle, said catch being attached at one end to said handle, said catch having an upper surface spaced below an upper surface of the handle said handle at its other end so as to define a notch that extends transversely of said handle, said notch merging into said slot forming an angular configuration, said catch engaging said lever when said link is in said slot and said link and said lever are pivoted away from said handle, said lever being disengagable from said catch for pivoting of said hatch to its fully open position only after said link is moved transversely of said handle out of said notch, the upper surface of said catch is spaced vertically below said upper surface of said handle adjacent said slot, whereby when a portion of the cam surface of said lever is pivoted into engagement with said catch said cover may pivot open a slight amount and thereby vent pressure in said vessel.

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4,388,874

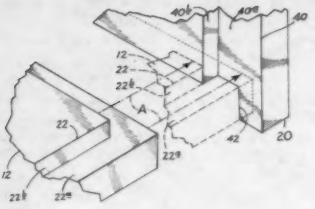
## PREFABRICATED CONCRETE VAULT

Frank K. Stone, 2227 SE. Division, Portland, Oreg. 97202

Filed Nov. 26, 1980, Ser. No. 210,823
Int. Cl.³ E05G 1/024
U.S. Cl. 109—79 6 Claims

1. A concrete vault construction comprising
(a) a wall structure forming an inner protected area,
(b) said wall structure comprising roof, floor, side and end wall members having defined peripheral edges,
(c) and door means in at least one of said members,
(d) said floor, side and end wall members having jointed overlapping connections therebetween,
(e) said edges of said members, in said jointed overlapping connections with adjacent members, having joint surfaces offset from each other across the seam of the joint to

provide non-continuous burglar-proof seams which lead from the exterior of said vault to the inner protected area, with said connections which exist between said floor and end wall members being defined, in one member associated with the connection, by an end-bounded, elongated recess, and in the other member associated with the connection, by a projection complementarily fitted in said recess.



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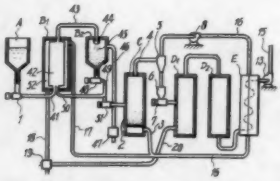
**4,388,875**

## EVAPORATING CONCENTRATOR FOR SEWAGE SLUDGE

**Yasuo Hirose, 801-88 Kanagaya, Asahi-ku, Yokohama City, Kanagawa, Japan**

**Filed Jun. 15, 1981, Ser. No. 273,284**
**Claims priority, application Japan, Mar. 28, 1981, 56-44743**
**Int. Cl.³ F23G *5/04***
**U.S. Cl. 110—224** **5 Claims**



1. An evaporative concentrator for sewage sludge comprising a heating chamber and an evaporating chamber between a feed hopper and a drying furnace having a fluidized sand bed, the concentrator further comprising

a first compulsory supply means for delivery of sewage sludge from said hopper through a first discharge pipe to said heating chamber,

a sewage sludge pass-way provided for said heating chamber connected with said first discharge pipe,

a second discharge pipe extending from said sewage sludge pass-way to a top space in said evaporating chamber with a nozzle fitted to the end of said second discharge pipe,

an exhaust gas pipe extending from said top space in said evaporating chamber to a condenser,

a second compulsory supply means mounted on a hopper-type bottom of said evaporating chamber, a third discharge pipe from said second compulsory supply means to a transfer pipe which is adapted to carry most of the sewage sludge to be expelled from said third discharge pipe to said sewage sludge pass-way,

a distribution means connecting said third discharge pipe with said drying furnace having a fluidized sand bed,

a first supply pipe for heating gas connected with a heating gas passage in said heating chamber,

a fourth discharge pipe from said heating gas passage, extending to a drain separation means,

a second supply pipe extending from said drain separation means to a combustion furnace, whereby the pressure $P_1$ in said sewage sludge pass-way is higher than the pressure $P_2$ in said heating gas passage, and the pressure $P_3$ in said top space of said evaporating chamber is lower than the pressure $P_2$ in said heating gas passage.

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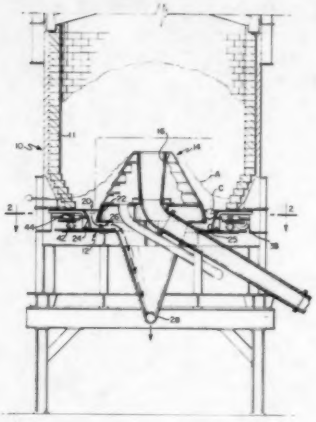
**4,388,876**

## ASH REMOVAL SYSTEM

**John A. Burton, Vancouver, Canada, assignor to Enterprises International, Inc., Olympia, Wash.**

**Filed Apr. 6, 1981, Ser. No. 251,397**
**Int. Cl.³ F23K *3/18***
**U.S. Cl. 110—275** **3 Claims**



1. An ash removal apparatus for a burner forming ash including large clinkers and having a combustion chamber, a floor, a grate on said floor, and an ash-removing passage in said floor at least partially encircling said grate, said apparatus comprising a set of opposed, downwardly converging first and second surfaces defining an ash-removing opening, at least one of said surfaces being movable solely radially toward the other surface for crushing large clinkers passing therebetween, means for moving said movable surface radially but without substantial circumferential movement, and means for discharging the ash including crushed clinkers through said ash-removing passage, said movable surface being carried on a continuous, generally cylindrical plate, means for mounting said cylindrical plate for radial, circumferentially progressive, eccentric, oscillatory motion so that the radial movement of the movable surface progresses circumferentially around said grate, said means for mounting said cylindrical plate including a roller carrier having a plurality of rollers thereon for moving in a horizontal circular path and an annular driving plate having a varying horizontal width defined by inner and outer edges whereby the radial distance from the center of the burner to the inner edge of the driving plate at any point in the burner varies upon rotation of the driving plate, and bearing means for transmitting the rotation of the driving plate inner edge to said oscillatory motion of said movable surface.

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**4,388,877**

## METHOD AND COMPOSITION FOR COMBUSTION OF FOSSIL FUELS IN FLUIDIZED BED

**Benjamin Molayem, Silver Spring, and David Garrett, Fort Washington, both of Md., assignors to Benmol Corporation, Alexandria, Va.**

**Filed Jul. 7, 1981, Ser. No. 280,978**
**Int. Cl.³ F23B *7/00***
**U.S. Cl. 110—342** **9 Claims**

1. A method for catalytically converting unburned hydro-

carbons and carbon monoxide to carbon dioxide and reducing nitrogen oxides to nitrogen in the combustion of fossil fuels in a fluidized bed while absorbing sulfur oxides, which comprises carrying out said combustion in the presence of a catalytic material for catalyzing said conversion and reduction reactions, said catalytic material being physically combined onto an adsorbent matrix selected from the group consisting of calcium aluminate, calcium aluminate cement, barium titanate, and calcium titanate.

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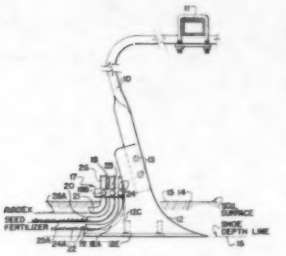
**4,388,878**

## MULTIPLE DEPOSITION TYPE SEEDER FOOT ASSEMBLY

**Fred W. Demzin, R.R. #1, Regina, Saskatchewan, Canada**

**Filed Oct. 19, 1981, Ser. No. 312,631**
**Int. Cl.³ A01C *5/00***
**U.S. Cl. 111—86** **18 Claims**



1. A seeder foot assembly attachable to a shank or the like, said feeder foot assembly comprising in combination a furrow opening body portion including a leading front end and a trailing rear side and at least two feeder tubes on the rear side, said tubes each including a substantially horizontal discharge portion one above the other in spaced apart relationship, each horizontal discharge portion including a rearwardly facing discharge end, the discharge end of the lowermost horizontal discharge portion extending rearwardly of the discharge end of the horizontal discharge portion immediately thereabove, said seeder foot assembly including means to initiate substantial closing of the furrow immediately behind said seeder foot assembly.

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**4,388,879**

## APPARATUS FOR SEQUENTIALLY FABRICATING PILLOWCASES OR LIKE PRODUCTS

**Palmer B. Everall, Jr., and Jack R. Lowery, Sr., both of Lancaster, S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.**

**Filed May 14, 1981, Ser. No. 263,686**
**Int. Cl.³ D05B *13/00***
**U.S. Cl. 112—10** **11 Claims**

1. Apparatus for sequentially fabricating pillowcases or like product comprising:

means for supplying continuous flat tubular material;

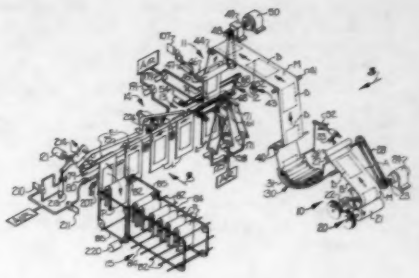
means for transversely cutting the continuous material into individual pieces;

means for feeding the continuous material from said supply means to said cutting means;

means operatively connected with and automatically controlling the operation of said cutting means and said feeding means for sequentially cutting the material into individual pieces of desired predetermined dimensions for the pillowcases;

conveying means for sequentially receiving the individual cut pieces of material, clamping one of the transverse cut ends thereof while allowing the remainder of the cut pieces of material to hang downwardly in a generally vertically-extending position, and conveying the so-positioned cut pieces sequentially in a predetermined path of travel; and

means for sequentially stitching the clamped transverse cut end of each piece of material to complete fabrication of



the pillowcases while each piece of material is being conveyed by said conveyor means with the remainder of each piece of material in the generally vertically-extending position.

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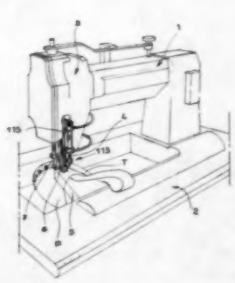
**4,388,880**

## MACHINE FOR STITCHING THE UPPER BORDER OF SHOES COMMONLY CALLED MOCCASINS

**Mario Ciucani, Via dell'Universita, 16, Fermo, Italy**

**Filed Sep. 5, 1980, Ser. No. 184,366**
**Claims priority, application Italy, Sep. 7, 1979, 3488 A/79; Apr. 30, 1980, 3406 A/80**
**Int. Cl.³ D05B *15/02, 27/08, 27/20***
**U.S. Cl. 112—49** **12 Claims**



1. A machine for stitching together first and second pieces of material using stitching thread in order to form a joint and border in shoes commonly called moccasins, said machine comprising:

a fixed planar work surface defining a work surface plane on which said material is disposed for stitching;

an elongated needle disposed so that its longitudinal axis is perpendicular to said work surface plane, said needle having a hook formed in the end of said needle nearest the work surface;

first reciprocating means for longitudinally reciprocating said needle along a first line of movement corresponding to its longitudinal axis, said reciprocation causing said hook in said needle to pass back and forth through said work surface plane;

second reciprocating means for transversely reciprocating said needle along a second line of movement, said second line of movement lying along said work surface plane and intersecting said first line of movement;

looping means for forming a loop of stitching thread, said

looping means disposed on the opposite side of said work surface plane from said needle, said hook in said needle serving to engage said loop of stitching thread, and said longitudinal reciprocation of said needle serving to draw said loop of stitching thread through said material and through a previously formed loop, said transverse reciprocation in combination with said longitudinal reciprocation serving to pass said needle back through said material to form a chain stitched joint;

feeding means for moving said material along said second line of movement toward said needle;

pressing means for releasably holding previously stitched material in fixed relation to said work surface; and

gripping means for gripping said first piece of unstitched material and for moving said first piece of material towards said needle, independently from said second piece of material.

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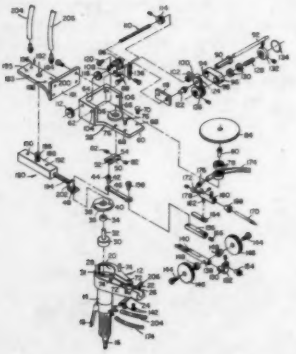
**4,388,881**

## HAND-HELD TUFTING MACHINES

**Herbert B. Price, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.**

**Filed Jun. 8, 1981, Ser. No. 271,788**
**Int. Cl.³ D05C *15/00***
**U.S. Cl. 112—80** **9 Claims**



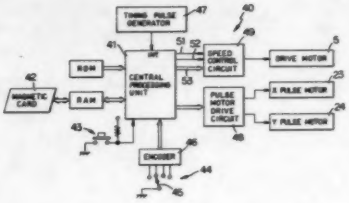
1. In a hand-held tufting gun for use with a high pressure source of air for projecting a loop of pile yarn through a backing material, a frame including air inlet means connected to said high pressure source and air outlet means, an operator influenced member for opening and closing passage of air from said inlet means to said outlet means, a needle-carrying member carried by and mounted for reciprocation relatively to said frame and provided with a hollow needle having a pointed end for piercing the backing material, power drive means for drivingly reciprocating said needle-carrying member, yarn feed means carried by said frame for feeding a supply of yarn to said needle in timed relationship with the reciprocation of said needle, said power drive means comprising a piston including a piston rod operatively connected to said needle carrying member, a piston housing, said piston being mounted within said piston housing for reciprocating between limits defined by the extent of travel of said piston, said piston housing including first and second ports, each port opening into said piston housing outside a respective limit of piston travel, and valve means for cyclicly communicating the first port to said air outlet means and the second port to atmosphere and thereafter communicating the first port to atmosphere and the second port to said air outlet means.

**4,388,882**

## AUTOMATIC SEWING MACHINE

**Yoshikazu Yamamoto, and Toshiaki Yanagi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Nov. 10, 1980, Ser. No. 205,688**
**Claims priority, application Japan, Nov. 24, 1979, 54-152185**
**Int. Cl.³ D05B *21/00***
**U.S. Cl. 112—121.12** **8 Claims**




1. In an automatic sewing machine having

stitch forming instrumentalities including an endwise reciprocatory needle,

a drive motor for reciprocating the needle to produce stitches in a workpiece,

drive means operative to vary the relative position between the needle and the workpiece,

stitch instruction storage means for storing stitch instructions capable of influencing the said relative positions to form a stitch pattern,

means operative synchronously with reciprocation of the needle for extracting the stitch instructions from the stitch instruction storage means in a predetermined sequence, and

position control means responsive to the extracted stitch instructions for controlling operation of the drive means between successive stitches in the stitch pattern,

the improvement comprising:

program storage means for permanently storing a series of program instructions containing a group forming instruction for forming a temporary group of stitch instructions from the stitch instructions stored in said stitch instruction storage means, a scanning instruction for scanning said temporary group to examine variation of said relative position between successive stitches to be produced according to said temporary group, and a speed determining instruction for determining a maximum permissible speed of said drive motor depending on the result of the examination, said temporary group consisting of said extracted stitch instruction and a predetermined number of instructions to be extracted in said predetermined sequence following said extracted stitch instruction;

processing means operative synchronously with reciprocation of said needle for performing said series of program instructions and generating permissible speed data related to said maximum permissible speed; and

speed control means responsive to said permissible speed data for limiting actual speed of said drive motor to said maximum permissible speed or less during production of one stitch according to said extracted stitch instruction.

**4,388,883**

## STITCH PATTERN SEWING MACHINE

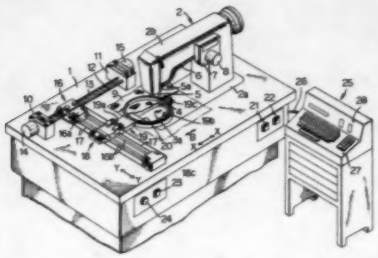
**Kunio Hirota, and Masao Shimomura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Feb. 24, 1981, Ser. No. 237,423**

**Claims priority, application Japan, Mar. 5, 1980, 55-28394; Mar. 19, 1980, 55-37270**

**Int. Cl.³ D05B *21/00***

**U.S. Cl. 112—121.12** **8 Claims**



**1.** An automatic sewing machine comprising:

stitch forming means including a reciprocatory needle;

a workholder for holding a workpiece during sewing operation, said workholder being movable in a coordinate plane defined by X and Y axes which are perpendicular to one another;

drive means to move said workholder along said X and Y axes for varying the relative position between said workholder and said needle to form a unit stitch pattern consisting of plural cell patterns which are each defined by a respective one of plural geometrical parts respectively of a sphere in which said unit stitch pattern is to be formed, said sphere being predeterminately divided into said geometrical parts with plural straight lines;

memory means for storing unit stitch pattern information consisting of plural blocks of cell pattern information corresponding to said plural geometrical parts and each including plural sets of X and Y coordinate data representing location of apexes of said geometrical parts respectively;

manually operable input means for setting up desired number of stitches to be formed in each of said plural cell patterns, said manually operable input means generating stitch number data corresponding to said number of stitches; and

control means for calculating position data related to actual stitch positions in said unit stitch pattern according to said coordinate data and said stitch number data, and for supplying the calculated position data to said drive means in timed relating with reciprocation of said needle.

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**4,388,884**

## STITCH PATTERN SEWING MACHINE

**Kunio Hirota, and Masao Shimomura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Feb. 24, 1981, Ser. No. 237,424**

**Claims priority, application Japan, Mar. 5, 1980, 55-28394; Mar. 19, 1980, 55-37266**

**Int. Cl.³ D05B *21/00***

**U.S. Cl. 112—121.12** **8 Claims**

**1.** In an automatic sewing machine including:

stitch forming means including a reciprocatory needle,

a workholder for holding a workpiece during sewing operation,

drive means for moving said workholder to vary the relative position between said workholder and said needle,

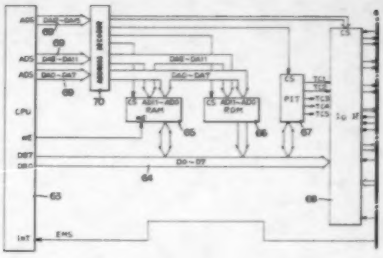
memory means for storing plural blocks of unit pattern information each of which corresponds to respective predetermined plural unit stitch patterns to be formed on said workpiece, each of said plural blocks of unit pattern information including a plurality of position data related to said relative position,

means for selecting at least two blocks of desired unit pattern information from said memory means to form at least two desired unit stitch patterns on said workpiece, and

means for extracting said position data of the selected unit pattern information, and for supplying the extracted position data to said drive means in timed relation with the reciprocation of said needle,

the improvement comprising;

manual input means for setting up a numerical limit indicative of allowed area within which said workholder is allowed to move in said sewing operation,



control means, operative prior to said sewing operation, for extracting said position data of the selected blocks of unit pattern information, for calculating numerical result indicative of the maximum movement amount of said workholder in forming the selected unit stitch patterns, for comparing said numerical result with said numerical limit set up by said manual input means, and for generating a signal when said numerical result exceeds said numerical limit, and

means, responsive to said signal generated by said control means, for warning of movement of said workholder beyond the allowed area in advance of starting said sewing operation.

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**4,388,885**

## GAP STITCH MECHANISM FOR SEWING MACHINES

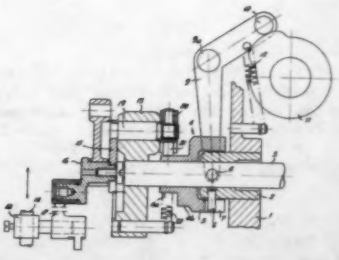
**Ernst Dreier, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland**

**Filed Oct. 1, 1980, Ser. No. 192,712**

**Claims priority, application Switzerland, Oct. 1, 1979, 8800/79**

**Int. Cl.³ D05B *69/02***

**U.S. Cl. 112—221** **12 Claims**



**1.** A gap stitch mechanism for a sewing machine containing

a needle shaft which is oscillatingly driven by a crank assembly, wherein the crank assembly is provided with means for reducing a crank radius at predetermined intervals during a sewing operation, thereby determining the stroke of the needle shaft and making it impossible for a loop catcher to catch a needle thread, a drive crank of the needle shaft being supported by an adjusting crank which is rotatable in a bearing bore hole of an arm shaft crank for the purpose of shortening the crank radius.

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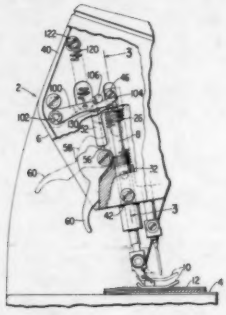
**4,388,886**

## REDUCED LOAD PRESSER BAR

**Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Dec. 17, 1981, Ser. No. 331,692**
**Int. Cl.³ D05B *29/02***
**U.S. Cl. 112—237** **5 Claims**



1. A presser bar mechanism for a sewing machine having a frame and a work supporting surface, said mechanism having: a presser bar reciprocally movable in its axial direction; a presser foot attached to one end of said presser bar; means for urging said presser bar in a direction toward said work supporting surface; and counter balance means for urging said presser bar in a direction away from said work supporting surface comprising:

a. an actuating member;

b. an abutting surface attached to said presser bar for reciprocal movement therewith in a predefined path;

c. control means for positioning said actuating member into either of two positions, in the first of said two positions said actuating member is disposed within said predetermined path, in the second of said two positions said actuating member is disposed outside of said predefined path;

d. a spring arranged to bias said actuating member in a direction parallel to said predefined path so that when in said first of said two positions said actuating member engages said abutting surface thereby urging said presser bar in said direction away from said work supporting surface.

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**4,388,887**

## WINDING DEVICE FOR A SEWING MACHINE

**Urs Ruch, Berlingen, and Christian Ulmer, Steckborn, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland**

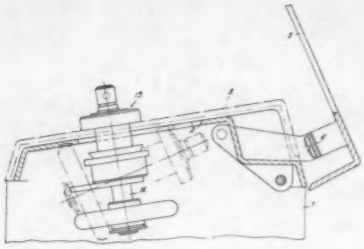
**Filed Dec. 9, 1980, Ser. No. 214,474**
**Claims priority, application Switzerland, Dec. 19, 1979, 11240/79**
**Int. Cl.³ D05B *59/00***
**U.S. Cl. 112—279** **3 Claims**

1. A winding device for a sewing machine including a sewing mechanism connected to a machine drive mechanism, by a coupling means which comprises,

a sewing machine housing, said winding device being adapted to swing into said sewing machine housing and be covered by a lid when not being used,

a two-armed hinge support pivotally disposed on the housing, said two-armed hinge support being connected to said lid,

one arm of said two-armed hinge support being connected by a lever mechanism with a support means, and



said support means being pivotally attached to the sewing machine housing for the winding device forming a toggle joint such that when the lid is opened the toggle joint is extended and the winding device is brought into its operating position and secured there while the other arm of the two-armed hinge support disengages said coupling between the machine drive mechanism and the sewing mechanism.

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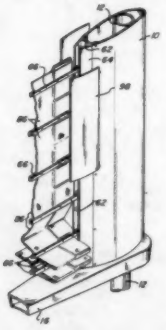
**4,388,888**

## ADJUSTABLE AIRFOIL

**Fred W. Gushurst, Jr., 6117 E. Otero Pl., Englewood, Colo. 80112**

**Filed Apr. 24, 1981, Ser. No. 257,385**
**Int. Cl.³ B63H *9/06, 9/08, 9/10***
**U.S. Cl. 114—90** **21 Claims**



1. An adjustable airfoil comprising:

a free-standing mast which is rotatable about an axis generally perpendicular to a support surface on which said mast is to be mounted, said mast having an upper end and a lower end;

at least a first arm fixedly attached to said upper end of said mast and extending perpendicular from said mast and a second arm fixedly attached to said mast below said upper arm and relatively adjacent to said lower end of said mast and extending perpendicular from said mast;

a vane rotatably mounted on said mast between said arms, said vane having luff slot means along an aft edge of said vane;

a sail made up of a plurality of articulated panels attached

together for folding in accordion fashion with means at the forward end of each panel slidably mounted in said luff slot means;

halyard means for raising and lowering said sail panels so that when in raised position, said panels form a substantially planar airfoil and when lowered, said panels are folded in accordion fashion on the deck; and

control means for selectively rotating the mast and the vane as required under different air conditions.

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**4,388,889**

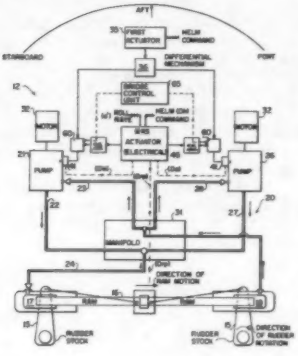
## ELECTRICAL ACTUATOR FOR SHIP ROLL STABILIZATION

**A. Erich Baitis, Stafford, Va.; Dennis A. Woolaver, Rockville, Md., and Richard T. Nigon, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 31, 1981, Ser. No. 248,389**

**Int. Cl.³ B63H *25/00***

**U.S. Cl. 114—144 E** **6 Claims**




5. In a roll reduction actuation means for a ship rudder stabilization system for controlling ship rudder to reduce wave and wind induced roll motions;

a means for generating a stabilizer command signal (Ds) for the ship rudders, said actuation means comprising a roll rate sensor for producing a ship roll rate signal (a') and a rate gain circuit for producing a roll rate gain factor (K), which is multiplied with the roll rate signal (a') to produce said stabilizer command signal (Ds).

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**4,388,890**

## DEVICE FOR LOCATING IN BUILDINGS THE EXACT POSITION OF HIDDEN OBJECTS

**Bengt Wester, and Anders West, both of Norra Hyllievägen 103, Malmö , Sweden (S 21622)**

**Filed Dec. 12, 1980, Ser. No. 216,315**

**Claims priority, application Sweden, Dec. 20, 1979, 7910517**

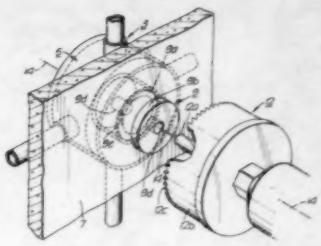
**Int. Cl.³ H02G *15/06***

**U.S. Cl. 116—204** **6 Claims**

1. A device for locating hidden objects such as electrical boxes, in buildings which objects are to be exposed by providing a hole in a covering unit, such as a plate like wall, over the object, said device comprising:

a first annular magnetic body mounted at the object to be located on one side of said covering unit, said first body having a guide hole formed therein, and having a conically tapered recess formed around said guide hold, said recess having a diameter greater than the diameter of said guide hole;

a second annular magnetic body which is movable along the other side of said covering unit for sensing the position of said first magnetic body, said second body having a guide hole formed therein, said guide holes being positioned on said bodies so as to be alignable on opposite sides of said covering unit for guiding a drill through said covering unit;



means for releasably attaching said first magnetic body to said object whereby said first magnetic body can be removed from said object after said object is located and exposed; and

wherein one of said magnetic bodies is a permanent magnet.

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**4,388,891**

## APPARATUS FOR APPLYING A PROTECTIVE COATING TO THE WELDING OR SOLDER SEAM OF CAN BODIES

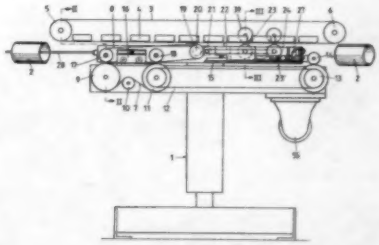
**Paul Opprecht, Herrenbergstrasse 10, 8962 Bergdietikon, Switzerland**

**Filed Sep. 14, 1981, Ser. No. 302,207**

**Claims priority, application Switzerland, Oct. 7, 1980, 7479/80; Jul. 17, 1981, 4710/81**

**Int. Cl.³ B05C *1/02, 7/08***

**U.S. Cl. 118—215** **14 Claims**



1. An apparatus for the application of a protective coating to a seam, such as a welded or soldered seam, of can bodies, comprising:

means for supplying the protective coating for application as a coating mass to the inside of the seam;

at least two driven rolls defining a first applicator roll and a second applicator roll at least partially immersible in the coating mass furnished by said supplying means;

said driven applicator rolls applying the coating mass to the inside of the seam;

said supplying means comprising a common container for the protective coating;

said two applicator rolls being arranged in tandem within said common container;

said first applicator roll being structured to be narrower than said second applicator roll and serving to cover a central region of said seam with said protective coating; and

said second applicator roll having a peripheral portion con-

taining means which preclude application of the protective coating at the region of said seam.

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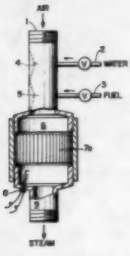
**4,388,892**

## PROCESS AND APPARATUS FOR GENERATION OF STEAM VIA CATALYTIC COMBUSTION

**Marc P. N. Rody, 8718 Arlington Blvd., Fairfax, Va. 22031, and Frank W. Sudia, 4817 Linnean Ave., Washington, D.C. 20008**

**Filed Jan. 26, 1981, Ser. No. 228,052**
**Int. Cl.³ B09B *3/00***
**U.S. Cl. 122—4 D** **36 Claims**




3. Apparatus for vaporizing water comprising
(a) a catalytic element,
(b) means for supplying a mixture of fuel, oxidizer and water to said element to support a combustion-vaporization reaction thereon, and
(c) means for utilizing the mixture of water vapor and combustion product gases so produced.

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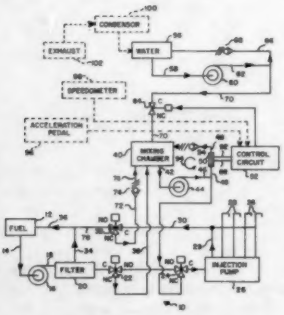
**4,388,893**

## DIESEL ENGINE INCORPORATING EMULSIFIED FUEL SUPPLY SYSTEM

**Richard Apfel, New York, N.Y., assignor to Cedco, Incorporated, New York, N.Y.**

**Filed Aug. 4, 1980, Ser. No. 174,852**
**Int. Cl.³ F02D *19/00***
**U.S. Cl. 123—25 J** **8 Claims**




1. A system for generating an emulsified fuel, comprising:
(a) first reservoir means for containing a quantity of fuel component;
(b) second reservoir means for containing a quantity of a non-combustible emulsion component;
(c) chamber means defining an output and a mixing chamber having an input for receiving said fuel component and said non-combustible emulsion component and outputing both of said components at its output;
(d) first means for providing said non-combustible component to said chamber means;
(e) second means for providing said fuel component to said chamber means;
(f) emulsifier means for receiving at its input both of said components from the output of said chamber means, and providing an emulsion at its output;
(g) third means for providing both of said components from the output of said chamber means to the emulsifier means;
(h) fourth means for providing at least a portion of the output of said emulsifier means to a device which consumes the emulsion of said fuel component an said non-combustible component;
(i) recirculation means for receiving that portion of said emulsion not provided to said device and returning it to said chamber means, allowing said portion not provided to said device to be returned to the emulsifier means;
(j) measurement means for measuring the ratio of the amount of said fuel component to the amount of said non-combustible component in said recirculation means; and
(k) control means responsive to said measurement means to vary the flow of said components to control said ratio.

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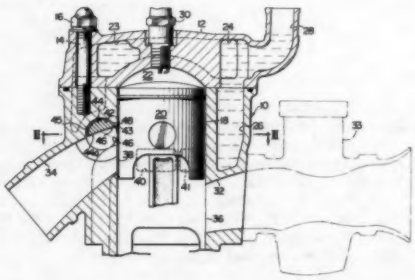
**4,388,894**

## TWO STROKE ENGINE HAVING EXHAUST TIMING CONTROL VALVE MEANS

**Shuji Tanaka, Iwata, and Toshio Nagata, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan**

**Filed Sep. 30, 1981, Ser. No. 307,165**
**Claims priority, application Japan, Sep. 30, 1980, 55/136888**
**Int. Cl.³ F02B *75/02*; F02D *9/06***
**U.S. Cl. 123—65 PE** **3 Claims**



1. A two-stroke engine comprising cylinder means, piston means which is received in said cylinder means for reciprocating movement, said cylinder means having exhaust port means adapted to be closed by said piston means, exhaust port timing control rotary valve means provided in said exhaust port means at upper portion thereof, said valve means being movable between a projected position wherein it is projected into the exhaust port means to thereby cover the upper portion of the exhaust port means and a retracted position wherein it is retracted from the exhaust port means, valve actuating motor means for actuating the valve means between said projected and retracted positions, control circuit means for controlling a power supply to said motor means, main switch means having first position for connecting the control circuit means with a power source, timer switch means for maintaining a power supply from said power source to said control circuit means for a predetermined time after the main switch means is actuated to a second position where it disconnects the power source from the control circuit means so that the valve means is moved to the retracted position after the main switch means is moved to the second position.

**4,388,895**

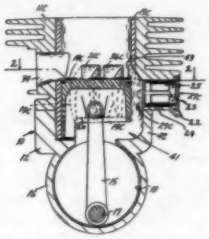
## FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

**Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.**

**Continuation of Ser. No. 133,098, Mar. 24, 1980, Pat. No. 4,294,202, which is a continuation-in-part of Ser. No. 941,596, Sep. 12, 1978, Pat. No. 4,202,298, which is a continuation-in-part of Ser. No. 859,476, Dec. 12, 1977, Pat. No. 4,143,626, which is a continuation-in-part of Ser. No. 839,180, Jul. 17, 1979, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May 18, 1973, abandoned. This application Aug. 7, 1981, Ser. No. 290,819**

**Int. Cl.³ F02B *33/04***

**U.S. Cl. 123—73 PP** **4 Claims**



1. A two-cycle, crankcase compression internal combustion engine having a cylinder with a piston movable in the cylinder between top and bottom dead center positions, fuel intake porting in the cylinder positioned to be controlled by the piston, reed valve controlled intake passage means communicating with the intake porting, the intake porting and passage means being positioned toward one side of the cylinder, exhaust porting at the side of the cylinder opposite to the intake porting, transfer ports in the cylinder wall, a first one of said transfer ports being positioned at a first side of the cylinder between the intake porting and the exhaust porting and the second one of said transfer ports being positioned at a second side of the cylinder opposite to said first side between the intake porting and the exhaust porting, auxiliary transfer porting in the cylinder wall at a level above the intake porting and communicating with the intake passage means, and two auxiliary passages in communication with the intake passage means independently and offset from each other, one toward said first side wall of the cylinder and the other toward said second side wall of the cylinder, said two auxiliary passages being in communication with the crankcase throughout the piston stroke and even in bottom dead center position of the piston.

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**4,388,896**

## LUBRICATING SYSTEM FOR A TWO-CYCLE ENGINE

**Stephen E. Sheridan, and James M. Hundertmark, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.**

**Filed Aug. 10, 1981, Ser. No. 291,717**

**Int. Cl.³ F01M *1/00***

**U.S. Cl. 123—73 AD** **10 Claims**

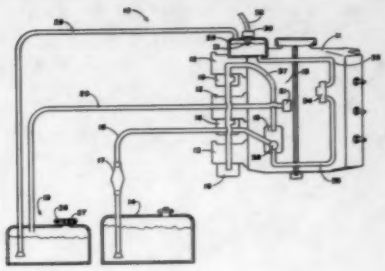
1. A lubrication system for a two-cycle, crankcase compression engine, comprising:

(A) a lubricant tank;

(B) a first conduit means connected from said lubricant tank to said engine for supplying lubricant to said engine;

(C) a second conduit means connected from the crankcase of said engine to said lubricant tank for pressurizing said tank, said lubricant being forced through said first conduit by the pressure in said tank;

(D) a lubricant reservoir mounted on said engine, and connected to said first conduit means to receive lubricant through said first conduit means; and



(E) a metering pump, said metering pump connected to receive lubricant from said reservoir and to supply metered lubricant to said engine.

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**4,388,897**

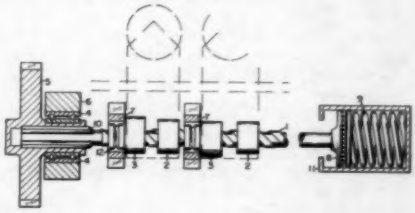
## VARIABLE CAMSHAFT ASSEMBLY

**Bernard Rosa, 11 Waverly Pl., New York, N.Y. 10003**

**Filed Sep. 22, 1980, Ser. No. 189,108**

**Int. Cl.³ F01L *1/34***

**U.S. Cl. 123—90.17** **5 Claims**



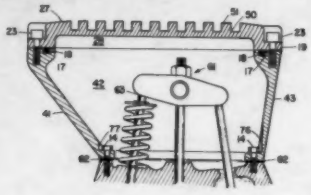
1. In an internal combustion engine employing a two part cam assembly to vary valve timing, including speed sensitive means, a double function cam-camshaft-camshaft support arrangement comprising, an axially movable camshaft acting against a camshaft return spring through the intercession of a rotatable bearing, said camshaft having a plurality of fixed cam surfaces thereon, a wormed portion alongside each fixed cam surface on said camshaft, a camshaft support positioned at or near each said wormed portion of said camshaft, a circular opening through each camshaft support of a diameter larger than that of said camshaft, independent secondary cams of substantially the same outer dimensions of said fixed cam surfaces on said camshaft, each said secondary cam possessing a circular protrusion axially alongside of such diameter and width to mate with and turn rotatably in said circular opening through said camshaft support, means to prevent axial movement of said secondary cam, a centrally positioned wormed opening through said secondary cam and associated circular protrusion of such size and configuration to mesh operably with said wormed portions on said camshaft, such a combination allowing said camshaft a certain amount of twisting axial movement, said twisting axial movement being induced by the combination of weight, rotational speed, and worming of said camshaft acting against the rotatably trapped secondary cams and said camshaft return spring, thereby permitting said cam-camshaft-camshaft support arrangement to vary valve timing while simultaneously acting operably as part of the speed sensing means.

4,388,898

## OIL CONTAINMENT DEVICE

Wally M. Larson, Evansville, Ind., assignor to Ronald Luttrell and Gerald Edson, both of Terre Haute, Ind.

Filed May 29, 1981, Ser. No. 268,570
Int. Cl.³ F01M 11/00
U.S. Cl. 123—90.38 4 Claims



1. An oil containment device for preventing loss of oil during valve adjustment of an internal combustion engine having rocker arm valve train assemblies and attachment means for securing a valve cover thereover, comprising,

an oil containment dam comprising a peripheral wall structure having upper and lower edges and including upstanding opposite end walls and upstanding side walls extended between said end walls,

means for attaching said peripheral wall structure to an engine with the valve cover attachment means thereof,

means for sealing the lower edge of the peripheral wall structure to the engine to prevent oil leakage therebetween,

said peripheral wall structure having a height such that the upper edge thereof is positioned above said valve train assembly upon attachment of the peripheral wall structure to the engine,

a cover being of a size and shape to cover and close the opening defined by the upper edge of the peripheral wall structure, and

means for removably securing and sealing said cover onto said peripheral wall structure,

said peripheral wall structure being free of projections which extend interiorly over said valve train assemblies whereby said valve train assemblies are freely accessible without interference by such projections.

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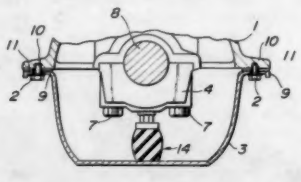
4,388,899

## NOISELESS COVERS

Kiyoshi Shimada, Yokosuka, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 18, 1981, Ser. No. 244,896
Claims priority, application Japan, Apr. 2, 1980, 55-44543[U]
Int. Cl.³ F02B 77/13; F02F 7/00
U.S. Cl. 123—198 E 5 Claims



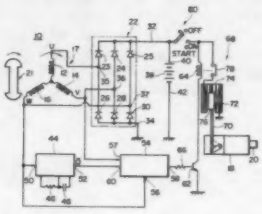
1. A noiseless cover such as an oil pan, front cover, cylinder head cover and the like mounted with its circumference onto an engine body, said cover comprising an elastic body fixed to part of said engine body and resiliently abutting against a mid-portion of an inner surface of said cover.

4,388,900

## AUTOMATIC STOPPING DEVICE FOR DIESEL ENGINE

Yoshikazu Hoshi, Tokai, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP80/00298, § 371 Date Aug. 5, 1981, § 102(e) Date Aug. 5, 1981, PCT Pub. No. WO81/01725, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 5, 1980, Ser. No. 293,217
Claims priority, application Japan, Dec. 7, 1979, 54/158068
Int. Cl.³ F02B 77/00
U.S. Cl. 123—198 DB 4 Claims



1. An automatic stopping device for diesel engines comprising: a multi-phase alternator connected to the output shaft of a diesel engine and having a plurality of output coils; a delay-type flip-flop having a data input terminal connected to the output coil of one of the phases of said multi-phase alternator and adapted to receive an input signal having forms of low and high levels, and a clock input terminal connected to the output coil of another phase of said multi-phase alternator and adapted to receive an input signal having the forms of low and high levels, said flip-flop being adapted to memorize the form of the input signal at said data input terminal when the form of input signal at said clock input terminal is changed from one to the other; and an engine stopping actuator having an input terminal connected to the output terminal of said delay-type flip-flop; the phase relation of said input signals to said data input terminal and said clock input terminal being so selected that, when said engine is operating in the forward direction, a high level signal representing the forward operation is generated at said output terminal of said delay-type flip-flop while, when said engine operates in the backward direction, a low level signal representing the backward operation is generated at said output terminal of said delay-type flip-flop, said engine stopping actuator being adapted to stop said diesel engine in response to said low level signal.

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4,388,901

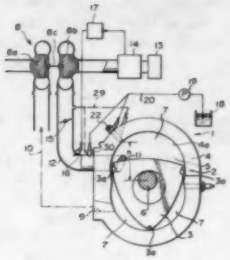
## LUBRICATING OIL SUPPLY SYSTEM FOR A SUPERCHARGED ROTARY PISTON ENGINE

Hiroshi Kodama; Tooru Maeda, and Toshio Miyatani, all of Hiroshima, Japan, assignors to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Filed Jul. 7, 1981, Ser. No. 284,233
Claims priority, application Japan, Jul. 7, 1980, 55-93141
Int. Cl.³ F01C 21/04
U.S. Cl. 123—213 7 Claims

1. A rotary piston engine including a casing having a rotor cavity, a rotor disposed in said rotor cavity of the casing for rotation and defining working chambers in said casing, intake passage means for supplying a charge of intake gas to the working chambers, throttle valve means provided in said intake passage means for controlling flow of the intake gas passing therethrough, supercharging means provided in said intake passage means upstream of the throttle valve means, lubricant oil supply means including oil passage means opening through outlet port means to at least one of the intake passage means downstream of the throttle valve means and the rotary cavity.

said lubricant oil supply means further including air passage means having one end opening to said oil passage means and



the other end opening to the intake passage means between said supercharging means and the throttle valve means.

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**4,388,902**

## IGNITION TIMING DEVICE AVOIDING PINGING DURING THE FUNCTIONING OF AN INTERNAL COMBUSTION ENGINE

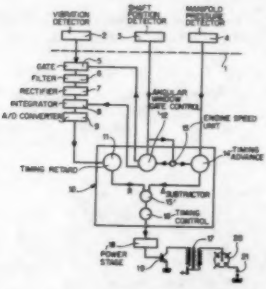
**Jean-Francois Latapie, Roquettes, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France**

**Filed Dec. 19, 1980, Ser. No. 218,309**

**Claims priority, application France, Dec. 20, 1979, 79 31281**

**Int. Cl.³ F02P** *5/04*

**U.S. Cl. 123—425** **9 Claims**



1. In an ignition timing device for an internal combustion engine, supplying an ignition signal for each cylinder staggered in relation to the top dead centre of the cylinder in question in accordance with at least one parameter, the set of parameters taken into consideration including the speed of rotation of the engine, this device being connected to a pinging detector comprising at least one vibration detector fixed on the engine and an electronic circuit designed to process the data supplied by the said detector to control the ignition timing, the said circuit taking the said data into account only in the angular window corresponding to that fraction of the cycle of each cylinder during which pinging can occur, the improvement comprising

(a) means for deriving a threshold signal value on the basis of the data supplied by the said detector in the said angular window of a cycle of a cylinder,

(b) comparison means for comparing the signal supplied by the vibration detector in the angular window of a subsequent cycle of said cylinder of the engine with said derived threshold value for the same cylinder of the engine, and

(c) means responsive to the said comparison means for controlling a modification of the ignition timing if pinging has occurred in the cylinder in question, and wherein said means for deriving a threshold value is effective to derive said value solely on the basis of the data supplied by said vibration detector during the corresponding angular window of the last preceding cycle of the same cylinder.

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**4,388,903**

## DEVICE FOR CONTROLLING AIR-FUEL RATIO FOR INTERNAL COMBUSTION ENGINES

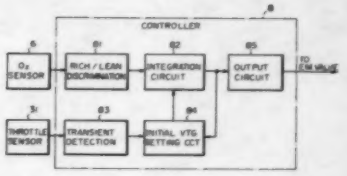
**Seietsu Yoshida; Masao Ito, both of Kariya; Yukio Kawai, Toyota, and Toshihisa Ogawa, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo K.K., Toyota, both of, Japan**

**Filed Apr. 6, 1981, Ser. No. 251,127**

**Claims priority, application Japan, Apr. 7, 1980, 55-44706**

**Int. Cl.³ F02B** *33/00*; **F02M** *7/00*

**U.S. Cl. 123—440** **15 Claims**




1. A device for controlling the air-fuel ratio of an air-fuel mixture supplied to an internal combustion engine, comprising:

air-fuel ratio regulating means for regulating the air-fuel ratio of the air-fuel mixture in response to a control signal;

an oxygen sensor for sensing the oxygen concentration in the exhaust gases of the engine and producing an oxygen signal indicative of the oxygen concentration;

a transient sensor for detecting a transient running state of the engine and producing a transient detection signal indicative of said transient running state, and;

an electronic controller for receiving said oxygen signal from said oxygen sensor and said transient detection signal from said transient sensor and supplying said control signal to said air-fuel ratio regulating means;

said electronic controller including an integrating means for effecting integration in response to the signal from said oxygen sensor and an initial setting means for operating, independently of said oxygen signal from said oxygen sensor, in response to said transient detection signal, changing the output signal of said integrating means quickly to a predetermined value, and causing said integrating means to commence the integration from said predetermined value.

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**4,388,904**

## AIR-FUEL RATIO CONTROL SYSTEM

**Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Division of Ser. No. 82,337, Oct. 5, 1979, Pat. No. 4,292,946.**

**This application Apr. 10, 1981, Ser. No. 253,008**

**Claims priority, application Japan, Nov. 15, 1978, 53-140667; Nov. 15, 1978, 53-140668**

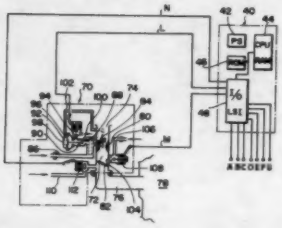
**Int. Cl.³ F02M** *7/18*

**U.S. Cl. 123—440** **1 Claim**

1. An air-fuel ratio control system for use with an engine carburetor including an induction passage provided therein with a fixed area venturi, a float chamber, a main fuel passage connected at one end to said float chamber and opened at another end to said fixed venturi, and an air bleed disposed in said main fuel passage, comprising:

(a) a control unit responsive to various engine operating parameters for determining the condition under which the engine is operating and providing first, second and third control signals, each corresponding to the determined engine operating condition;

(b) a main air passage opened at one end to atmospheric air and connected at another end to said air bleed;
(c) a main air flow control valve unit disposed in said main air passage, said main air flow control valve unit responsive to said first control signal and the pressure in said venturi for controlling the air flow through said main air passage, said main air flow control valve unit including a pneumatic control valve provided in said main air passage, said pneumatic control valve being responsive to the pressure in said venturi for controlling the air flow through said main air passage, and an electromagnetic valve disposed in said main air passage upstream of said pneumatic control valve, said electromagnetic valve being responsive to said first control signal for controlling the air flow through said main air passage;
(d) fuel supply means for supplying fuel;



(e) an auxiliary fuel passage connected at one end to said fuel supply means and at another end to said induction passage downstream of said venturi;
(f) an auxiliary fuel flow control valve provided in said auxiliary fuel passage, said auxiliary fuel flow control valve being responsive to the second control signal for controlling the fuel flow through said auxiliary fuel passage;
(g) an auxiliary air passage opened at one end to atmospheric air and at another end into said induction passage downstream of said throttle valve; and
(h) an auxiliary air flow control valve provided in said auxiliary air passage, said auxiliary air flow control valve responsive to the third control signal for controlling air flow through said auxiliary air passage.

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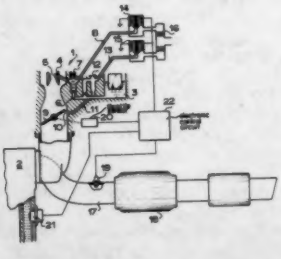
**4,388,905**

## AIR-FUEL RATIO CONTROL SYSTEM

**Toshiro Kurihara, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan**

**Filed Jul. 7, 1981, Ser. No. 280,968**
**Claims priority, application Japan, Jul. 16, 1980, 55-97359**
**Int. Cl.³ F02M *7/20***
**U.S. Cl. 123—440** **15 Claims**



1. In a system for controlling the air-fuel ratio control for a carburetor of an internal combustion engine having an induction passage, a throttle valve, an exhaust passage, first detecting means for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage and providing a detected output signal dependent thereon, air-fuel mixture supply means, and an on-off type electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by said air-fuel mixture supply means, the improvement comprising

electronic control means comprising a judging circuit means for judging the detected output signal of said first detecting means with a reference value corresponding to a stoichiometric air-fuel ratio value and for producing a first output dependent on the difference, and a first circuit means for producing a second output for driving said electromagnetic valve means operatively dependent on the first output of said judging circuit means for controlling the air-fuel ratio to a value approximately equal to the stoichiometric air-fuel ratio,

second detecting means for sensing engine load and for producing a third output dependent thereon,

third detecting means for sensing cold engine operation and for producing a fourth output dependent thereon, and

correcting circuit means adapted to be operated by said fourth output of said third detecting means for making said electronic control means non-responsive to the detected output signal from said first detecting means and for operatively connecting the third output of said second detecting means to said first circuit means.

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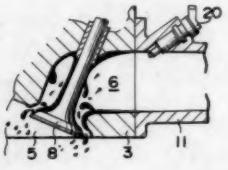
**4,388,906**

## FUEL INJECTED ENGINE CONTROL DEVICE AND METHOD PERFORMING WALL-ADHERED FUEL ACCOUNTING

**Shinichi Sugiyama, and Takayoshi Nakatomi, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Filed May 5, 1982, Ser. No. 375,196**
**Claims priority, application Japan, Jul. 6, 1981, 56-105338**
**Int. Cl.³ F02B *3/00***
**U.S. Cl. 123—492** **18 Claims**



1. For an internal combustion engine with a combustion chamber system and comprising an air-fuel mixture intake system formed with walls and comprising an intake manifold, said internal combustion engine further comprising a fuel injection valve fitted to said intake manifold which is selectively opened and closed by selective supply of an actuating signal thereto and which when so opened injects liquid fuel into said intake manifold, said internal combustion engine and said fuel injection valve operating according to an operational cycle:

an engine control method, comprising the processes, repeatedly and alternatingly and/or simultaneously performed, of:

(a) sensing the current values of certain operational parameters of said internal combustion engine;
(b) based upon the current values of said sensed operational parameters of said internal combustion engine, calculating the value of a first quantity representing the desired amount of fuel to be provided to said combustion chamber system of said internal combustion engine during the time period between the next two fuel injection pulse time points, the value

of a second quantity representing the proportion of fuel in one pulse of fuel injected through said fuel injection valve which will adhere to said walls of said air-fuel mixture intake system, and the value of a third quantity representing the proportion of the total amount of fuel adhering to said walls of said air-fuel mixture intake system which is sucked off therefrom to pass into said combustion chamber system of said internal combustion engine during the time interval between two successive fuel injection pulses; and

(c) at time points in said operational cycle of said internal combustion engine and said fuel injection valve which are proper fuel injection time points, performing the following processes in the specified order:

(c1) calculating, from the current value of a fourth quantity representing the total amount of fuel adhering to said walls of said air-fuel mixture intake system, and the current value of said third quantity representing the proportion of the total amount of fuel adhering to said walls of said air-fuel mixture intake system which is sucked off therefrom to pass into said combustion chamber system of said internal combustion engine during the time interval between two successive fuel injection pulses, the value of a fifth quantity representing the amount of fuel from the total amount of fuel adhering to said walls of said air-fuel mixture intake system which will be sucked off therefrom to pass into said combustion chamber system of said internal combustion engine in the time interval between the next fuel injection pulse time instant and the next fuel injection pulse time instant after it;

(c2) calculating, from the current value of said first quantity representing the desired amount of fuel to be provided to said combustion chamber system of said internal combustion engine during the time period between the next two fuel injection pulse time points, from the current value of said second quantity representing the proportion of fuel in one pulse of fuel injected through said fuel injection valve which will adhere to said walls of said air-fuel mixture intake system, and from the current value of said fifth quantity representing the amount of fuel from the total amount of fuel adhering to said walls of said air-fuel mixture intake system which will be sucked off therefrom to pass into said combustion chamber system of said internal combustion engine in the time interval between the next fuel injection pulse time instant and the next fuel injection pulse time instant after it, the value of a sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse;

(c3) calculating, from the current value of said sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse and the current value of said second quantity representing the proportion of fuel in one pulse of fuel injected through said fuel injection valve which will adhere to said walls of said air-fuel mixture intake system, the value of a seventh quantity representing the amount of fuel from the next fuel injection pulse that will adhere to said walls of said air-fuel mixture intake system;

(c4) updating the value of said fourth quantity representing the total amount of fuel adhering to said walls of said air-fuel mixture intake system by adding thereto the value of said seventh quantity representing the amount of fuel from the next fuel injection pulse that will adhere to said walls of said air-fuel mixture intake system and by subtracting from the result of this addition the value of said fifth quantity representing the amount of fuel from the total amount of fuel adhering to said walls of said air-fuel mixture intake system which will be sucked off therefrom to pass into said combustion chamber system of said internal combustion engine in the time interval between the next fuel injection pulse time instant and the next fuel injection pulse time instant after it;

(c5) modifying said actuating signal according to the value of said sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse; and

(c6) supplying said modified actuating signal to said fuel injection valve in such a fashion as to cause said fuel injection valve to open for a time period which will allow an amount of fuel approximately equal to the fuel amount represented by said sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse to pass through said fuel injection valve so as to be injected into said intake manifold;

wherein the method used in subprocess (c2) for calculating the value of said sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse is such that the sum of the value of said sixth quantity representing the actual fuel amount to be injected through said fuel injection valve in the next fuel injection pulse and the value of said fifth quantity representing the amount of fuel from the total amount of fuel adhering to said walls of said air-fuel mixture intake system which will be sucked off therefrom to pass into said combustion chamber system of said internal combustion engine in the time interval between the next fuel injection pulse time instant and the next fuel injection pulse time instant after it less the value of said seventh quantity representing the amount of fuel from the next fuel injection pulse that will adhere to said walls of said air-fuel mixture intake system is approximately equal to the value of said first quantity representing the desired amount of fuel to be provided to said combustion chamber system of said internal combustion engine during the time period between the next two fuel injection pulse time points.

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**4,388,907**

## SINGLE POINT FUEL INJECTED INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATING SAME

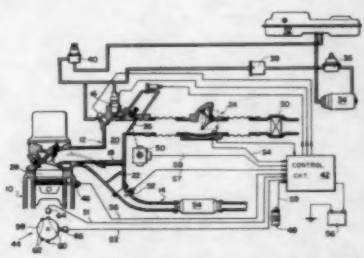
**Yuko Sugo, and Tadahiro Yamamoto, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Nov. 12, 1980, Ser. No. 206,309**

**Claims priority, application Japan, Nov. 15, 1979, 54-158480[U]**

**Int. Cl.³ F02B *3/00***

**U.S. Cl. 123—494** **3 Claims**



**1.** In a multi-cylinder internal combustion engine having an ignition system, a crankshaft and a single fuel injector for forming the air-fuel mixture fed to the multiple cylinders of said engine, the combination of:

means for producing pulses at a first rate which pulses define a first pulse train signal;

means for producing pulses at a second rate which is lower than said first rate and which pulses define a second pulse train signal;

a fuel injection control circuit operatively connected to said single fuel injector for controlling the injections thereof; and

a circuit responsive to one of the speed of said engine and the load of said engine and which selectively supplies said first

pulse train signal to said fuel injection control circuit when said one of said engine speed and engine load is below a predetermined level and which selectively supplies said second pulse train signal to said fuel injection control circuit when said one of said engine speed and engine load are above said predetermined level and which induces said single fuel injector to inject fuel in synchronism with the pulses of the selected one of said first and second pulse train signals, said first and second pulse producing means taking the form of a disc operatively connected to said crankshaft for synchronous rotation therewith, said disc having first and second sets of markers thereon; and first and second pickups juxtaposed said disc to be respectively responsive to the movement of said first and second markers.

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**4,388,908**

## ELECTRICALLY CONTROLLED VALVE OPERATING SYSTEM, PARTICULARLY FOR FUEL INJECTION

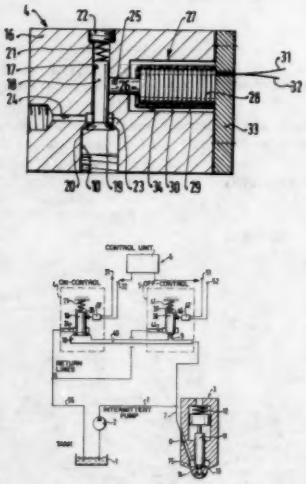
**Rudolf Babitzka, Kirchberg; Walter Beck, and Walter Schlagmüller, both of Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Oct. 15, 1981, Ser. No. 311,676**

**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039967**

**Int. Cl.³ F02D *1/16*; F02M *37/04***

**U.S. Cl. 123—500** **14 Claims**



**1.** Fuel injection system having

a pump (**2, 62**);

an injection valve (**3, 63**);

hydraulic connection means (**7, 67**) connecting the pump and the injection valve to provide fuel from the pump to the valve, and wherein the injection valve opens to emit fuel when the pressure of applied fuel in the hydraulic connection means exceeds a predetermined opening value, and the injection valve closes when the pressure drops below a predetermined closing value;

and an electrically controlled valve arrangement, hydraulically connected to said hydraulic connection means to control the pressure therein,

which comprises, in accordance with the invention,

a first valve (**4, 64**) which controls initiation of fuel injection by selective control of the pressure in the hydraulic connection means, and a second valve (**5, 65**) which controls termination of injection;

each one of the first and second valves having

a valve housing (**16, 36**) and a valve element (**18, 38; 38', 38''**) which is movable in predetermined direction within a bore **17, 37**) of the valve housing, and hydraulically connected to said hydraulic connection means, for movement by hydraulic pressure in the connection means, acting on the movable valve element;

and an electrically controlled positioning element (**27, 47; 47', 47''**) having a positioning movement which has at least one component which is transverse to the moving direction of the movable valve element and which is operable between a first clamping position in which the respective positioning element clamps the respective valve element against the wall of the respective housing, and a second, released position in which the movable element releases the clamping force applied to said movable valve element to permit movement of the valve element by hydraulic pressure.

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**4,388,909**

## FUEL INJECTION TIMING CONTROL SYSTEM FOR A DIESEL ENGINE

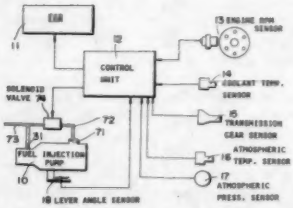
**Hiroshi Ogasawara, and Miyao Takai, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Oct. 27, 1981, Ser. No. 315,507**

**Claims priority, application Japan, Oct. 28, 1980, 55-154020[U]**

**Int. Cl.³ F02M *37/08*; F02B *47/08***

**U.S. Cl. 123—501** **8 Claims**



**1.** A fuel injection timing control system for a diesel engine, comprising:

(a) a fuel injection pump for supplying fuel to the engine, timed periodically according to the rotation of the engine crankshaft;

(b) a device connected to the fuel injection pump for varying the fuel injection timing in terms of crank angle;

(c) an EGR means for selectively recirculating exhaust gas through the engine; and

(d) a control unit connected to the fuel injection timing varying device and the EGR means and operable to advance the timing of the fuel injection with regard to a crank angle when the EGR means is operating to effect recirculation of exhaust gas through the engine as compared to when said recirculation is suspended.

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**4,388,910**

## INTAKE EXPANSION CHAMBER APPARATUS FOR INTERNAL COMBUSTION ENGINES

**Glenn E. Birdwell, 1302 Wright Rd., Alcoa, Tenn. 37901**

**Filed Jun. 22, 1981, Ser. No. 276,000**

**Int. Cl.³ F02M *31/00***

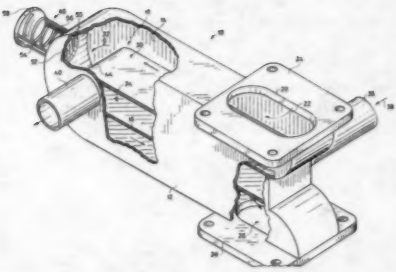
**U.S. Cl. 123—547** **3 Claims**

**1.** An intake expansion chamber apparatus for internal combustion engines which preheats and expands the vaporized fuel/air mixture as said mixture flows between the carburetor

and combustion chamber through a conduit such as the intake manifold, and wherein the heat is supplied to the fuel/air mixture by the exhaust system of said internal combustion engine, said apparatus comprising:

a wall defining an enclosure;

a further wall disposed at least partially within said enclosure and serving to partition said enclosure into an expansion chamber section and a heating chamber section, said expansion chamber section having a first leg which has a first end portion which communicates with said fuel/air mixture inlet and a further end portion, and a second leg which has a first end portion which communicates with said fuel/air mixture outlet and a further end portion, the further end portions of said first leg and said further leg being joined in fluid communication such that said first leg and said further leg are disposed substantially parallel with each other and substantially coextensive, said heating chamber section including an exhaust intake joined in fluid communication with said exhaust system of said internal combustion engine, and an exhaust outlet joined in fluid communication with said exhaust system of said internal combustion engine at a location downstream from said exhaust intake, whereby heated gases from said exhaust system flow through said heating chamber section and heat said further wall to form a heat transfer surface;



said expansion chamber section being interposed in the intake manifold of said internal combustion engine between said carburetor and said combustion chamber, and including a fuel/air mixture inlet connected in fluid communication with said intake manifold, and a fuel/air mixture outlet joined in fluid communication with said intake manifold at a location downstream from said fuel/air mixture inlet, said expansion chamber section serving to direct said fuel/air mixture over said heat transfer surface defined by said further wall for purposes of heating and expanding said mixture prior to its introduction into a combustion chamber of said internal combustion engine, such that vaporization is improved and hydrocarbons are more completely combusted; and

a safety valve providing selective fluid communication between said expansion chamber section and the ambient atmosphere, said safety valve disposed proximate the juncture at which said further end portion of said first leg and said further end portion of said second leg are joined in fluid communication, said safety valve serving to release pressure within said expansion chamber section when said pressure exceeds a preselected value as during an engine backfire.

**4,388,911**

## APPARATUS FOR PRODUCING A DEFINED FUEL VAPOR-AIR MIXTURE FOR GASOLINE INTERNAL COMBUSTION ENGINES

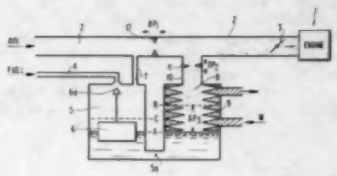
**Klaus Lindenmaier, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 15, 1980, Ser. No. 216,482**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950126**

**Int. Cl.³ F02M *31/00***

**U.S. Cl. 123—557** **10 Claims**



1. An apparatus for producing a defined fuel vapor-air mixture for an internal combustion engine which includes an intake manifold means for supplying intake air to the engine, the apparatus comprising a chamber means for accommodating a liquid fuel, and a vaporizer chamber having a heated means for vaporizing the liquid fuel, each of the chamber means and vaporizer chamber have a gas space and a liquid space, first means are provided for communicating the liquid spaces of the chamber means and vaporizer chamber to each other, second means are arranged in the intake manifold for restricting a flow of intake air and causing a pressure gradient, third means are provided for communicating the gas space of the vaporizer chamber with the intake means at a position downstream of the second means as viewed in a flow direction, the pressure gradient caused by the second means being effective by way of said third means to control a level of liquid fuel in the vaporizer chamber, fourth means are disposed in the third means for providing a vacuum in the gas space of the vaporizer chamber such that a vacuum pressure in the gas space of the vaporizer chamber is about 0.01–40% of a vacuum pressure ambient in the intake manifold means at a position downstream of the second means, and the heated means includes at least one vaporizer surface arranged in the vaporizer chamber in such a manner that an area of the vaporizer surface wetted by the liquid fuel increases as a level of liquid fuel in the vaporizer chamber rises.

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**4,388,912**

## EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR A DIESEL ENGINE

**Yoshiyuki Kimura, Yokosuka; Masaji Shiobara, Chigasaki, and Yasutaka Yoshiba, Chiba, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jul. 21, 1981, Ser. No. 285,544**

**Claims priority, application Japan, Jul. 23, 1980, 55-100898**

**Int. Cl.³ F02M *25/06***

**U.S. Cl. 123—569** **30 Claims**

1. An exhaust gas recirculation control system for a diesel engine, which comprises:

(a) an intake duct;

(b) an exhaust duct;

(c) an exhaust gas recirculation duct communicating between said intake duct and said exhaust duct;

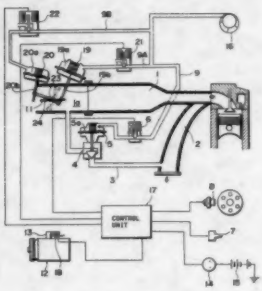
(d) a vacuum source;

(e) an exhaust gas recirculation valve disposed on said exhaust gas recirculation duct;

(f) a first vacuum actuator for actuating said exhaust gas recirculation valve, said first vacuum actuator being actuated by vacuum generated by said vacuum source;

(g) a throttle valve disposed within said intake duct;
(h) a second vacuum actuator for actuating said throttle valve, said second vacuum actuator being actuated by a vacuum generated by said vacuum source;
(i) a third vacuum actuator for actuating said throttle valve in cooperation with said second vacuum actuator and in accordance with engine operating conditions so that said throttle valve is controlled stepwise through any of its fully-open, half-open, and fully-closed positions, said third vacuum actuator being actuated by a vacuum generated by said vacuum source; and
(j) a control unit for controlling said first and second vacuum actuators in accordance with engine operating conditions including engine load.

25. A method of controlling exhaust gas recirculation for a diesel engine, which comprises the following steps:
(a) detecting the load of an engine;
(b) detecting an engine operating condition;
(c) comparing a signal ($S_{10}$) representative of the detected engine load with a first signal ($S_{21}$) representative of the



detected engine operating condition on the basis of a first predetermined voltage function between the two;
(d) opening an exhaust gas recirculation valve fully when the signal ($S_{10}$) representative of the detected engine load is smaller than the first signal ($S_{21}$) representative of the detected engine operating condition and closing the exhaust gas recirculation valve fully when $S_{10}$ is greater than $S_{21}$;
(e) comparing the signal ($S_{10}$) representative of the detected engine load with a second signal ($S_{22}$) representative of the detected engine operating condition on the basis of a second predetermined voltage function between the two which is preset to be more sensitive to $S_{10}$ than the first predetermined voltage function; and
(f) closing a throttle valve fully, within the range where the exhaust gas recirculation valve is fully opened, when the signal ($S_{10}$) representative of the detected engine load is smaller than the second signal ($S_{22}$) representative of the detected engine operating condition and opening the throttle valve fully when $S_{10}$ is greater than $S_{22}$.

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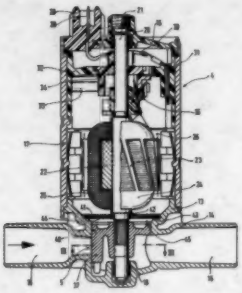
**4,388,913**
**ADJUSTMENT DEVICE FOR ROTARY ANGLE ADJUSTMENT**

**Gerold Grimm, Leonberg; Klaus Rose, Mundelsheim; Ulrich Kemmner; Rainer Schillinger, both of Stuttgart, and Alois Stemmer, Vaihingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 17, 1980, Ser. No. 217,354**
**Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001473**
**Int. Cl.³ F02M *23/04***
**U.S. Cl. 123—585** **3 Claims**

1. In an adjustment device for rotary angle adjustment including a housed servomotor connected via a shaft with a throttle device, said throttle device arranged to control the cross section of a bypass line bypassing a throttle valve disposed in an intake tube of an internal combustion engine, the improvement wherein said adjustment device is axially limited on one end by a cap having a bore, which is cast with a portion of said bypass line, said throttle device being embodied as a partially cylindrical rotary slide valve which passes trans-



versely through said bore in said cap and into said bypass line, said servomotor including an armature portion, and an apertured, loosely guided sealing disc on said shaft disposed between said armature portion and said throttle valve means, said sealing disc further having a surface area arranged to be received by a sealing face of said cap upon a pressure drop at said sealing disc, whereby said servomotor is arranged to control a throttle valve means in said bypass line.

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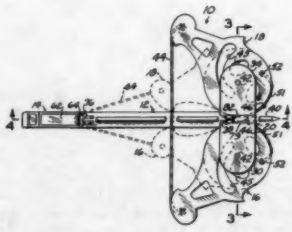
**4,388,914**
**CROSSBOW WITH COIL SPRING FORCE DEVELOPING MEANS FOR PROJECTING AN ARTICLE**

**Louie P. Cesin, 6220 SW. 20 St., Miami, Fla. 33155**

**Filed Jun. 8, 1981, Ser. No. 271,346**
**Int. Cl.³ F41B *5/00***
**U.S. Cl. 124—27** **4 Claims**



1. A crossbow, comprising:
a casing having a forward end and a rearward end;
wing mounting bracket means transversely connected to the forward end portion of said casing for pivoting mounting a pair of wing;
a pair of wings respectively connected, at one end portion, to respective end portions of said bracket means for pivoting movement of their other end portions toward and away from said casing;
said one end portion of each wing of said pair of wings having a part-circular convex surface;
a bowstring extending between and connected with said other end portions of said wings;
an elongated compression spring longitudinally disposed within said casing;
movable stop means within the forward end portion of said

casing for limiting forward movement of said compression spring;

a follower longitudinally slidable within said casing and abutting the rearward end of said compression spring;

elongated flexible strand means extending longitudinally within said casing and connected with said follower,

the forward end portion of said strand means extending around a peripheral portion of the respective convex wing surface and connected with the respective wing forwardly of said bracket means for transferring a biasing force exerted by said compression spring, when the later is compressed, to said other end portion of said wings in a forward direction to pivot the wings forwardly and cause the bowstring to exert a force on a projectile and project a projectile forwardly;

a pistol grip member connected with and closing the rearward end of said casing; and,

trigger means supported by said pistol grip member to permit a member holding the cocked bowstring to flex downwardly under the force of the bowstring and release said bowstring.

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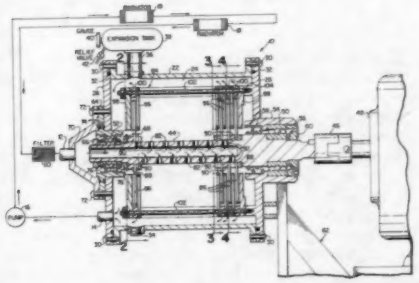
**4,388,915**

## HEAT GENERATOR FOR A CIRCULATING HEATING SYSTEM

**Dimitry Shafran, 67 Russwin Rd., New Britain, Conn. 06053**

**Filed Sep. 11, 1980, Ser. No. 186,185**
**Int. Cl.³ F24C 9/00; F22B 3/06**
**U.S. Cl. 126—247** **12 Claims**



1. A frictional heat generator for fluid to be used in a circulating system, comprising a housing defining a substantially cylindrical closed-end chamber, a driven shaft rotatably supported on the longitudinal axis of said housing chamber in sealed relationship with the housing to prevent the flow of fluid to and from the housing chamber around said shaft, said shaft being provided with an axial bore extending from one end through a substantial part of its length within the housing and also being provided with longitudinally and circumaxially spaced transverse radial openings through its wall from the bore into the housing chamber, means supporting a longitudinally spaced series of perforated rotor discs along said shaft for rotation therewith, a cylindrical structure supported within the housing chamber in radially inward spaced relation to the housing and supporting a longitudinal series of perforated annular stator discs within the housing chamber so that a stator disc is disposed between adjacent rotor discs in spaced relationship, the cylindrical structure including a series of stator spacer rings arranged one between each pair of adjacent stator discs and secured to the housing, each stator spacer ring being provided with a plurality of circumaxially spaced radial channels for the flow of fluid outwardly into the housing chamber from the area within said cylindrical structure wherein the rotor and stator discs are located, the inner periphery of the stator discs being radially spaced outwardly from the shaft, and the outer periphery of the rotor discs being radially spaced inwardly from the said cylindrical structure, means for introducing fluid under pressure to the shaft bore during shaft rotation which then flows to the housing chamber through the radial openings in the shaft to be subjected to heat by friction caused by the relative motion of the rotor and stator discs, and conduit means connected to the housing for receiving and circulating the friction heated fluid.

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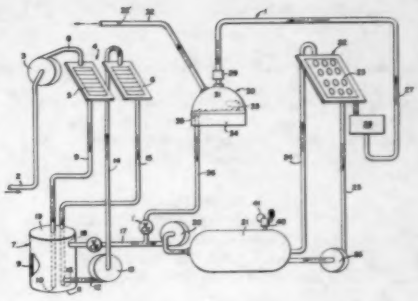
**4,388,916**

## STEAM GENERATION APPARATUS

**Albert L. Murdock, P.O. Box 71, Millers Creek, N.C. 28651**

**Filed Oct. 1, 1981, Ser. No. 307,615**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—427** **9 Claims**



1. A steam generation apparatus including, primary water heating means including at least one solar energy collector, a supply line providing water to said primary water heating means, a hot water storage tank, first inlet and outlet lines joining said primary water heating means in series with said storage tank, second inlet and outlet lines joining said primary water heating means to said hot water storage tank to provide recirculation of water therebetween, a high pressure-hot water tank, a line supplying hot water to said high pressure-hot water tank from said storage tank, pump means acting on said hot water in said high pressure-hot water tank to maintain water therein under pressure, supplemental water heating means including at least one solar energy collector, recirculating lines directing said hot water under pressure from said high pressure-hot water tank through said supplemental heating means and returning said hot water at a further elevated temperature to said high pressure-hot water tank, an expansion tank, a hot water delivery line from said supplemental heating means to said expansion tank, thermal valve means in said hot water deliver line adjacent said supplemental heating means operable to allow passage of hot water therethrough upon attaining a specified elevated temperature, pressure reducing valve means in said hot water delivery line adjacent said expansion tank, a steam outlet line extending from said expansion tank, and said expansion tank having a water return line adapted to receive condensation formed in said expansion tank.

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**4,388,917**

## TRIANGULAR SOLAR COLLECTOR

**H. Richard Shea, Jr., 440 Walker Rd., Great Falls, Va. 22066**

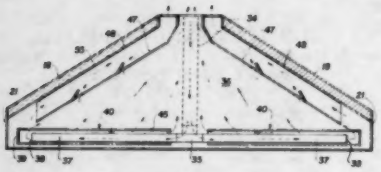
**Filed Jan. 16, 1981, Ser. No. 225,643**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—450** **17 Claims**

1. A solar collector comprising:

a substantially triangular-shaped housing having a base and a pair of converging side walls such that the width of said housing decreases further from said base, said housing including an outlet adjacent the top of said housing, an inlet, a central area generally beneath said outlet, and a pair of outer end areas each spaced apart generally horizontally from said central area;

absorbing means in said housing to absorb incident solar radiation;

a panel of solar transparent material, said panel being secured to the front of said housing for allowing said incident solar radiation to pass through said panel to be incident upon and absorbed by said absorbing means;



air distributor means for distributing cool air from said inlet along said base of said housing; and

barrier means inclined from the vertical and adjacent said converging side walls for creating air ducts connecting said outer end areas to said outlet to prevent stagnation of air in said outer end areas.

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**4,388,918**

**MENTAL HARMONIZATION PROCESS**

**Charles C. Filley, 1207 Saxony La., Houston, Tex. 77058**

**Filed Jun. 5, 1981, Ser. No. 270,904**

**Int. Cl.³ A61B *19/00***

**U.S. Cl. 128—1 C** **2 Claims**

1. Method of producing a state of mental relaxation in a subject, comprising, in combination, the steps of:

(a) exposing solely to one field of vision of the subject a first color determined by the subject to be pleasing to him while simultaneously exposing solely to the other field of vision of the subject the complementary color of said first color; and

(b) exposing solely to one ear of the subject a first audible tone determined by the subject to be pleasing to him while simultaneously exposing solely to the other ear of the subject a second audible tone harmonious with said first audible tone; and

(c) said colors being viewed by the subject while simultaneously listening to said audible tones.

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**4,388,919**

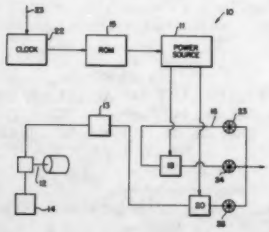
**RAPID STABILIZATION OF EXTERNAL CARDIAC PULSATION**

**Joel M. Benjamin, Jr., Hoffman Estates, Ill., and Victor Meyer, Jr., Telford, Pa., assignors to Intermedics Cardiassist Corporation, Freeport, Tex.**

**Filed Nov. 17, 1980, Ser. No. 207,692**

**Int. Cl.³ A61H *7/00***

**U.S. Cl. 128—64** **6 Claims**




1. In a process of applying external cardiac pulsation by applying pressure pulses to the limbs of a subject in synchronization with the subject's heartbeat and wherein said pressure pulses are characterized by a cycle comprising relatively rapid pressure-rise time and a relatively long peak pressure period before a drop in the pressure at the end of each said pulse, the improvement comprising initiating said process by adjusting the synchronization of the pressure of said pressure pulses with the heartbeat of the subject over a relatively short period of time by increasing stepwise, over a period of up to about 100 heartbeats, the rate of change of the pressure during pressure-rise or pressure-drop period and gradually increasing the time of said peak pressure period.

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**4,388,920**

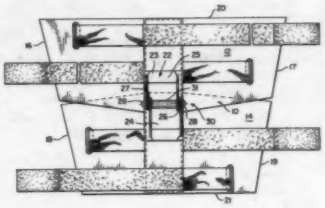
**VARIABLE POSITION KNEE IMMOBILIZER**

**Mark J. Hajost; Robert L. Crevling, and Fred B. Powell, all of Greenwood, S.C., assignors to Professional Medical Products, Inc., Greenwood, S.C.**

**Filed Oct. 26, 1981, Ser. No. 314,900**

**Int. Cl.³ A61F *3/00***

**U.S. Cl. 128—80 C** **5 Claims**



1. A variable position knee immobilizer comprising:

a flexible cover having upper and lower sections each in planar orientation having upper and lower edges and opposite side edges and adapted to be wrapped about and surround the thigh and calf portions of a patient's leg;

securing means connected to said upper and lower sections of said cover for fastening the cover around the patient's leg above and below the knee; and

stiffener support means comprising upper and lower elongate, interconnected generally flat plates operatively connected to corresponding upper and lower sections of the cover generally centrally of their side edges and extending from adjacent the top edge to the bottom edge of each section to be located along the back of the leg generally parallel to the length of the leg with adjacent ends of the plates being positioned directly behind the knee, and means pivotally interconnecting the adjacent ends of the plates for rotatably positioning the plates and the upper and lower sections of the cover, said pivotal interconnecting means including means for locking the plates at varying positions of the patient's knee to immobilize the leg in such positions.

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**4,388,921**

**DEVICE COMPRISING A PLATE AND SCREWS FOR FASTENING A PLATE TO A BONE**

**Franz Sutter, Niederdorf, and Fritz Straumann, Waldenburg, both of Switzerland, assignors to Institut Straumann AG, Waldenburg, Switzerland**

**Filed May 22, 1981, Ser. No. 266,351**

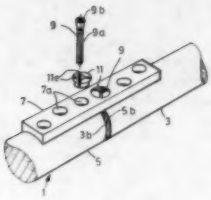
**Claims priority, application Switzerland, May 28, 1980, 4156/80**

**Int. Cl.³ A61F *5/04***

**U.S. Cl. 128—92 B** **15 Claims**

1. A device connectable with a bone, comprising a plate with at least two clearance holes; retaining means for retaining the plate on a bone and including sleeves each having a clamping part extending through the clearance hole and provided with slots and an inner contact surface and an outer surface, and a

collar made of one piece with the clamping part and protruding beyond the outer surface of the latter so as to bear against the side of the plate facing away of the bone; and screws for fastening the plate to the bone and each having an axis, a threaded portion to be screwed into the bone, and an expander displaceable relative to the clamping part in an axial direction



and having an outer contact surface in contact with the contact surface of the clamping part and coaxial with the screw axis in at least one position of the screw, in which position at least one of the said two contact surfaces converges in the direction of the screw axis, in such a way, that by displacing the expander, the clamping part may be clamped tight within the clearance hole.

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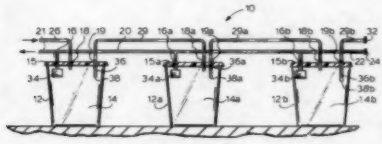
**4,388,922**

## SUCTION CANISTER SYSTEM FOR SERIAL COLLECTION OF FLUIDS

**Anil Telang, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Filed Jul. 29, 1981, Ser. No. 287,840**
**Int. Cl.³ A61M 1/00**
**U.S. Cl. 604—319** **13 Claims**



**1.** A suction canister system for collection of patient body fluids comprising:

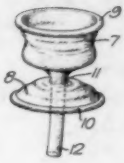
a plurality of canisters, each canister including a receptacle and a cover having a vacuum port therethrough communicating with the interior of the receptacle, means including a fluid inlet port to permit the flow of fluid therethrough into the receptacle, and means including a fluid outlet port to permit the flow of fluid therethrough out of the receptacle, the last of the plurality of canisters to be filled in the serial collection arrangement including means to prevent fluid from flowing thereout, the vacuum ports of said canisters being connected in parallel fluid communication with each other and having means for connection to a source of vacuum, the inlet port on the canister first in the serial line for collection of fluids having means for connection to a source of fluid outside of the canister system, the outlet port of each canister connected to the inlet port on a successive canister in a serial fluid flow arrangement whereby fluid is collected in said canisters successively.

**4,388,923**

## EXTERNAL URINARY DRAINAGE DEVICE

**Ken Heimreid, Brananvein 44B, Heistad, Norway**

**Filed Apr. 27, 1981, Ser. No. 257,614**
**Claims priority, application Norway, May 13, 1980, 801426**
**Int. Cl.³ A61F 5/44**
**U.S. Cl. 604—352** **9 Claims**



**1.** In an external urinary drainage device which includes a condom having an open rearward end and a forward end in sealed communication with a length of hose for transferring the urine, the condom having a length and shape such as to cover only the head (glans) of the penis, the improvement comprising a funnel shaped sheathing body means coaxial with the condom and sealing connected around the periphery of the condom adjacent the forward end thereof and so located that, when the condom surrounds the head of the penis and the foreskin has been drawn forward over the condom, the sheathing body means can be reversed to encase the condom and foreskin.

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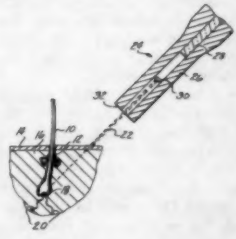
**4,388,924**

## METHOD FOR LASER DEPILATION

**Howard R. Weissman, 9216 Middlebelt, Livonia, Mich. 48150, and Joseph Mantel, 21819 Constitution, Southfield, both of Mich. 48076**

**Filed May 21, 1981, Ser. No. 265,878**
**Int. Cl.³ A61N 5/00**
**U.S. Cl. 128—303.1** **7 Claims**

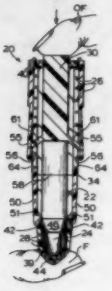


**1.** The method of devitalizing a hair of a human subject as part of a process of depilation, comprising: aiming a source of a narrow beam of light, the source having a substantial component of wavelength to which the skin of the patient is substantially non-absorbative and the hair root of the patient is substantially absorbative, at a point on the epidermis of the patient spaced from the exit point of the hair body and in a direction such that the extension of the beam would intersect the hair root, and applying a short, high-energy pulse of such light energy from such beam to cause sufficient heating of the hair root to destroy the blood vessels supplying the hair root.

## 4,388,925
## AUTOMATIC RETRACTABLE LANCET ASSEMBLY

James A. Burns, Elizabeth, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Mar. 23, 1981, Ser. No. 246,523
Int. Cl.³ A61B 17/34
U.S. Cl. 128—314 9 Claims



1. An automatically retractable spring lancet assembly for piercing human skin which assembly includes automatic release of the drive spring for retraction, characterized by
(a) a housing having an aperture;
(b) a plurality of elongate openings in said housing;
(c) a lancet mounted in said housing for reciprocable movement therein;
(d) a point on said lancet positioned adjacent the interior side of said housing aperture;
(e) a depressable plunger mounted for reciprocation in said housing in the end thereof opposite said housing aperture;
(f) the outer end of said plunger extending out of said housing for engagement;
(g) a sleeve slidable on said housing and positioned to engage said lancet in the piercing forward movement thereof;
(h) a first compressed spring extending between said housing and said sleeve for the piercing forward movement of said lancet upon engagement of said plunger;
(i) a second uncompressed spring extending between said lancet and said housing for the compression thereof and automatic retraction of said lancet after the said piercing forward movement thereof;
(j) cooperating means extending between said plunger and said housing for automatically disengaging said first spring from said lancet after said lancet completes its piercing movement for allowing the automatic retraction of said lancet back through said housing aperture;
(k) a flexible skirt positioned on said housing for maintaining said sleeve in position for compressing said first spring; and
(l) a plurality of flexible arms adapted to flex outwardly upon depression of said plunger and contact said flexible skirt and cause said skirt to flex outwardly to thereby become disengaged from said sleeve thereby releasing the restraining force applied to said first spring so that said sleeve moves forward to cause the said forward piercing movement of said lancet.

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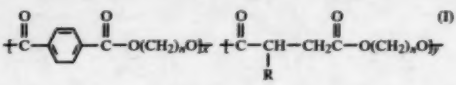
## 4,388,926
## HIGH COMPLIANCE MONOFILAMENT SURGICAL SUTURES COMPRISING POLY[ALKYLENE TEREPHTHALATE-CO-(2-ALKENYL OR ALKYL)SUCCINATE]

Shalaby W. Shalaby, Lebanon, and Edgar Schipper, Cranford, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Dec. 22, 1980, Ser. No. 218,998
Int. Cl.³ A61L 17/00
U.S. Cl. 128—335.5 17 Claims

1. A drawn and highly oriented thermoplastic surgical filament comprising a copolymer consisting essentially of a multiplicity of recurring polyalkylene terephthalate and polyalkylene alkyl or alkenyl succinate units having the following general formula:



wherein n is 2 to 6, R is a linear or branched alkyl or alkenyl radical with a chain length of about 4 to 30 carbon atoms and x and y are integers such that the polyalkylene terephthalate units comprise 70 to 90 mole percent of the copolymer.

2. A filament of claim 1 having a surgical needle attached to at least one end and useful as a surgical suture.

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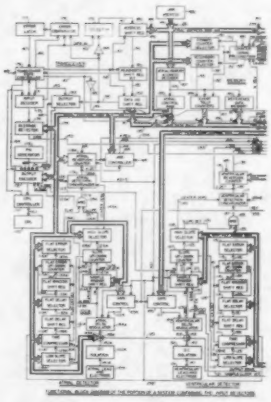
## 4,388,927
## PROGRAMMABLE DIGITAL CARDIAC PACER

Robert C. Schober, Huntington Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 13, 1979, Ser. No. 103,401
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 31 Claims

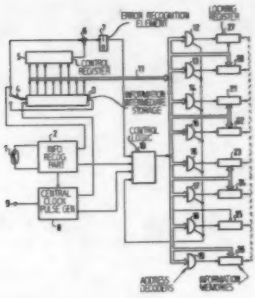


1. Implantable cardiac pacing apparatus comprising:
electrode means adapted to couple a stimulating signal to the heart and for sensing a cardiac signal;
sensing means for sensing signals on said electrode means;
selection circuit means responsive to the signals sensed by said sensing means for detecting a predetermined component of a natural cardiac cycle;
first timing circuit means having a first timing source operating at a first rate for generating timing signals representative of time periods in a cardiac cycle including a rate time out period during which said predetermined component is expected to occur;
second timing circuit means synchronized with said first timing circuit means and having a second timing source independent of said first timing source and operating at a second, faster rate for generating a rate limit enable signal defining a predetermined mimimum period relative to the commencement of a cardiac cycle and ending during a normal cardiac rate time out period; and
generator means for generating a stimulating signal on said electrode means if said selection circuit means fails to detect said predetermined component during said rate time out period and being inhibited from generating said stimulating signal until said rate limit signal is generated by said second timing circuit means.

## 4,388,928
## SIGNAL PROCESSING MEANS PARTICULARLY FOR HEART PACEMAKERS

Christer Ekwall, Solna, and Hakan Elmqvist, Bromma, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,221
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939197
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 5 Claims




1. Signal processing means, particularly for heart pacemakers, comprising a signal reception part and a routing device connected with said signal reception part which routes specific signal information for storage,

(a) a memory bank having information memories connected with said routing device and operative for receiving respective types of signal information; and

(b) a locking register (27) allocated to the memory bank and individually controlling enablement of said information memories (20 through 26), into which locking register (27) a locking signal can be inscribed for each information memory which is specifically assigned to said information memory, and on the basis of which a change of the stored informational content is made impossible as long as an opening signal for an appertaining information memory is not input into the locking register (27) from the outside;

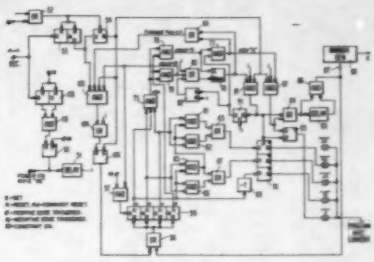
(c) said information memories (20 through 26) having respective information inputs connected in common with said signal reception part for receiving signal information therefrom, and each having a respective individual control input for selectively enabling a change of the informational content stored by such information memory, and each having an address decoder means as part of said routing device for determining which information memory is intended to receive signal information supplied to the information inputs from the signal reception part; and

(d) said locking register (27) being connected with and controlling the control input of each of said information memories (20 through 26) and individually controlling the enablement of said information memories (20 through 26) for locking selected individual information memories against a change of stored informational content by means of respective individual locking signals being inscribed in said locking register (27) with respect thereto, and for enabling a change of stored informational content of only a selected individual one of said information memories by means of said opening signal therefor.

## 4,388,929
## PROGRAMMABLE PACER AND METHOD OF EXTERNAL PROGRAMMING

Alexis C. M. Renirie, Wijchen; Kornelis A. Mensink, and Frederik H. M. Wittkampf, both of Brummen, all of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Filed Dec. 11, 1980, Ser. No. 215,559
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 18 Claims



1. A pacemaker having a stimulus generator for delivering stimulus signals at a given rate, the rate of said stimulus signals being programmable, having means for receiving external program signals comprising on-off type signals and means for varying said rate as a function of said received program signals, characterized by said varying means comprising

means for counting first and second sequenced series of said program signals;

decade control means for controlling said rate so that the decade component of said rate corresponds to a first count of said counting means; and

unit control means for controlling said rate so that the unit component of said rate corresponds to the other count of said counting means.

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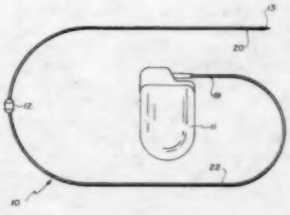
## 4,388,930
## CARDIAC CATHETER ELECTRODES FOR PACEMAKERS PROVIDED WITH A CARDIAC RF RECEIVER FOR EMERGENCY PACING

Ferruccio De Bellis, Rome, Italy, assignor to S.B.M. Societa Brevetti per la Medicina S.R.L., Italy

Filed Sep. 18, 1981, Ser. No. 303,596
Claims priority, application Italy, Oct. 7, 1980, 49838 A/80
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PS 5 Claims




1. A catheter electrode for pacemakers provided with a parallel RF cardiac receiver for emergency pacing at radio frequency comprising an integral length of catheter electrode including an inner conductive portion comprising a coiled wire and an outer sheath so called spaghetti, the pacemaker being located at one end and the pacing tip being located at the other end of said catheter electrode, wherein the small-sized coil unit of said RF cardiac receiver is directly connected to said length of the catheter electrode at a suitable position between said

two ends thereof and a small portion of said inner wire is exposed through removal of a corresponding area of said spaghetti.

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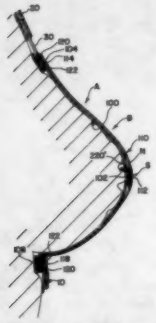
4,388,931
BRASSIERE WITH IMPROVED SEAM
Frank G. Farino, Shaker Heights, Ohio, assignor to Leading Lady Foundations, Inc., Beachwood, Ohio
Filed Sep. 30, 1981, Ser. No. 307,104
Int. Cl.[3] A41L *3/00*
U.S. Cl. 128—425 10 Claims



1. In a brassiere of the type having breast receiving cups, each of which is formed from an inner body engaging fabric segment with an outer periphery and an outer decorative fabric segment with an outer periphery, wherein said segments are basted at their peripheries and are each formed from two sections of fabric joined together at a common contour producing seam extending generally across said cup, the improvement comprising: said seam of each of said segments including a sewed joint between its two sections and defining inwardly folded marginal strips captured between said segments at said contour producing seam.

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4,388,932
PROCESS FOR IMPROVING FILLING POWER OF EXPANDED TOBACCO
Henry B. Merritt, Richmond, and Larry M. Sykes, Midlothian, both of Va., assignors to Philip Morris, Incorporated, New York, N.Y.
Filed Dec. 31, 1980, Ser. No. 221,910
Int. Cl.[3] A24B *3/18*
U.S. Cl. 131—291 11 Claims

1. In a process for expanding tobacco by a method which includes the steps of contacting tobacco with an expansion agent and then heating the tobacco to produce expanded tobacco having an OV value of less than about 6%, the improvement which comprises subjecting the expanded tobacco, having said OV value, to further heating under temperature conditions lower than the maximum temperature used for expanding the tobacco so that the heated, expanded tobacco has an OV value of less than 2%.

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4,388,933
TOBACCO STEM TREATMENT AND EXPANDED TOBACCO PRODUCT
Norman B. Rainer, and Dean M. Siwiec, both of Richmond, Va., assignors to Philip Morris, Inc., New York, N.Y.
Filed Jun. 25, 1981, Ser. No. 277,571
Int. Cl.[3] A24B *3/18*
U.S. Cl. 131—293 17 Claims

1. A process for expanding rolled and cut tobacco stems which comprises the steps of:
(a) treating tobacco stems having a moisture content between about 2 and 40% with an aqueous hydrogen peroxide mixture under alkaline conditions and in the presence of at least one compound of a multivalent metal to expand and bleach said stems, and
(b) drying the peroxide-treated tobacco stems to effect removal of water, and roasting the dried stems to restore a tobacco-like color thereto.

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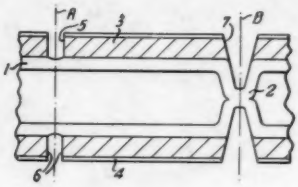
4,388,934
FILTERS
John A. Luke, Romsey, England, assignor to British-American Tobacco Company Limited, London, England
Filed Jun. 3, 1981, Ser. No. 269,702
Claims priority, application United Kingdom, Jun. 18, 1980, 8019887
Int. Cl.[3] A24D *3/04*
U.S. Cl. 131—339 8 Claims



1. A tobacco-smoke filter comprising a smoke filtration diaphragm of tubular form forming a first filtration stage and a smoke-pervious layer of fibrous material in which the diaphragm is ensheathed and which forms a second filtration stage, the layer having a transverse cross-section impervious to the passage of tobacco-smoke, the tubular diaphragm being closed at a location spaced longitudinally from said cross-section of said cross-section of said layer so that smoke passes generally radially through said first filtration stage and generally axially through said second filtration stage.

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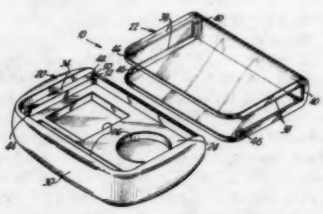
4,388,935
HINGELESS COMPACT
Andrew N. Napolitane, 350 E. 52nd St., New York, N.Y. 10022
Filed Apr. 30, 1981, Ser. No. 259,023
Int. Cl.[3] A45D *33/00*
U.S. Cl. 132—83 R 23 Claims



1. A hingeless compact for cosmetic articles comprising:
a generally rectangular plate member having front, rear and two opposed side edges with the upper surface of said plate member being configured to hold cosmetic articles, said plate member including a continuous flange formed integrally therewith and circumscribing said front and side edges, said flange extending above and below the plane of the upper and lower surfaces of said plate member respectively, said upper and lower surfaces each including a pair of opposed shelves extending along the length of said side edges with each said shelf being spaced

from the free end of the adjacent flange and extending perpendicular thereto; and

a generally U-shaped resilient cover member adapted to slidably encase said plate member and having a configuration complimentary thereto, with the perimeter of said flange defining the dimensions of said cover member such that in the closed condition of said compact a smooth surfaced enclosure is defined, said U-shaped resilient cover member cooperating with said plate member to frictionally maintain said compact in a closed condition and whereby when said compact is opened said cover member is slidably moved in a direction towards the rear of said plate member guided by said flange, with the side edges of said cover member slidably moving along said shelves.

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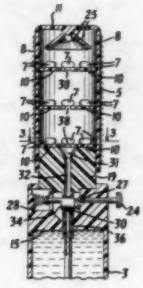
**4,388,936**

## COMBINATION APPLICATOR-DISPENSER HAIR STYLER

**Shephard D. Roberts, P.O. Box 136, Brooklyn, N.Y. 11216**

**Filed Mar. 22, 1982, Ser. No. 360,599**
**Int. Cl.³ A45D *40/30***
**U.S. Cl. 132—88.5** **12 Claims**



1. A hair treatment applicator-dispenser comprising, a container for containing; therein a preparation usuable for application to hair; a housing section for holding the mechanism, control and dispenser for contents of said container; a dome receptacle head to direct the dispensed contents and engage the hair curler at the lower portion; said hair curler comprising a removal tubular cover on said container closed at one end and closing said container as a cover and usuable as a hair curler having a length sufficient for wrapping hair thereareound; saidcurler including a tubular band removably mounted on said container axially over said curler cover; said band having both ends open when removed from said curler cover, a cross section open parallel to and fitting axially over said cover in use as a hair curler with hair wrapped thereareound.

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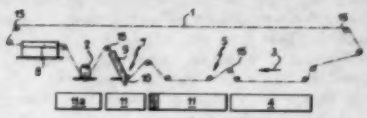
**4,388,937**

## MACHINE FOR THE CHEMICAL FROSTING OF GLASS ARTICLES

**Claude M. Moret, 51 rue Pasteur, 77120 Pommeuse, France**

**Filed Sep. 2, 1981, Ser. No. 298,776**
**Int. Cl.³ B08B *3/02***
**U.S. Cl. 134—73** **6 Claims**

1. A machine for chemically frosting articles made of glass, more particularly flasks, said machine being of the type comprising a continuous conveyor-chain passing consecutive treatment stations, from frosting to drying, and furthermore comprising holders in the form of sealing stoppers for said flasks, characterized in that the conveyor-chain is made of a material resistant to the reactants used, is equipped with hooking means co-operating with holders for the articles to be frosted, and is in the form of links hinged in pairs about an axis, said axis being



extended outwardly on at least one side of the chain to act as a hooking means for the holders of the articles.

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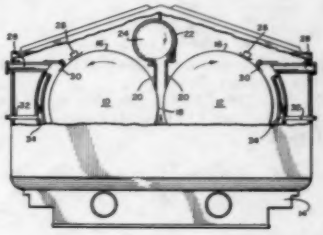
**4,388,938**

## FILTER CLEANING APPARATUS

**John M. Dubowik, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed May 11, 1981, Ser. No. 262,462**
**Int. Cl.³ B08B *3/02***
**U.S. Cl. 134—104** **3 Claims**



1. In an apparatus for removing liquid from a fibrous material suspension to form a fibrous mat: a rotatable drum provided with a circumferential filter; means for applying a differential pressure across said filter to form a fibrous mat on the filter; means for thereafter removing the fibrous mat from the filter; and cleaning means for cleaning the filter after the fibrous mat has been removed, said cleaning means having a stationary member located outside the drum and extending along the length of the drum, said stationary member having a flexible membrane in contact with the filter, said flexible membrane having openings extending therethrough; and means for flowing liquid under pressure through said openings and through the filter.

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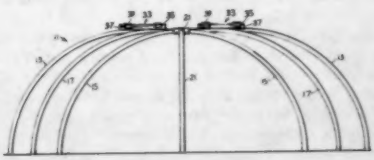
**4,388,939**

## LAND-USE PORTABLE KNOCK-DOWN HUNTING-BLIND FRAME

**Roy C. Barton, Rte. #1, Waltonville, Ill. 62894**

**Filed Jun. 11, 1981, Ser. No. 272,535**
**Int. Cl.³ A45F *1/16***
**U.S. Cl. 135—3 R** **7 Claims**



1. A knock-down portable frame for supporting a waterproof cover to form a hunter-concealing blind, comprising: a plurality of pairs of arcuate-ninty-degree bent pipes, each pair having pipes of the same length but having a length different

from the length of pipes of the remaining pairs of pipes of said plurality, each said pair of pipes being releasably joined endwise to an vertical pipe by telescoping elements to define a generally semi-elipsoidal space when over-ground-supported in an assembled parallelism; a pair of L-shaped pipes releasably endwise-joinable to form a flat-topped arch for transversely supporting said endwise joined ends of said pairs of arcuate pipes; and short rigid elements transversely and horizontally spacedly fixed to the top of said flat-topped arch for telescopically connecting said endwise joined ends of said pairs of arcuate pipes to each other and to said top of said flat-topped arch.

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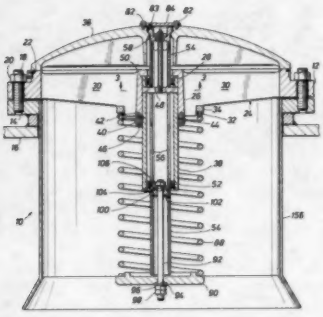
**4,388,940**

## PRESSURE RELIEF DEVICE

**Walter W. Powell, Houston, Tex., assignor to Anderson, Greenwood & Co., Bellaire, Tex.**

**Filed Mar. 23, 1981, Ser. No. 246,323**
**Int. Cl.³ F16K *13/04***
**U.S. Cl. 137—70** **12 Claims**



1. A pressure relief device for a liquified gas storage vessel comprising

an annular flange having means for securing said flange around an opening in the upper portion of a storage vessel and an annular seat,

a guide tube supported within said seat,

a valve closure,

a spindle connected to and having its outer end to support the valve closure for movement to and from said seat extending through said valve closure and its inner end extending through said guide tube,

means having a preselected strength connecting said spindle to said tube to retain said valve closure against opening movement with respect to said annular seat, and

biasing means engaging the inner end of said spindle to bias said valve closure toward seated position on said seat,

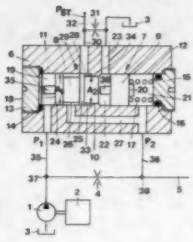
said retaining means releasing its connection when the pressure within the storage vessel creates forces on said closure exceeding the preselected strength of the retaining means and the force of said biasing means to release said valve closure to open and said biasing means returns said valve closure to said seat when pressure force on said closure is less than the force of the biasing means.

**4,388,941**

## APPARATUS FOR PRODUCING A ROTARY SPEED-DEPENDENT CONTROL PRESSURE

**Josef Riedhammer, Horb, Fed. Rep. of Germany, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Nov. 5, 1981, Ser. No. 318,684**
**Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041873**
**Int. Cl.³ F15B *5/00***
**U.S. Cl. 137—82** **4 Claims**



1. A device for producing a rotary speed responsive control pressure, comprising, a housing and piston means in a bore formed in said housing, said piston means having first and second faces on opposite sides thereof slidably disposed therein, a pump driveable over a range of rotary speeds, said pump having an output conduit, a measuring throttle disposed in said output conduit with upstream and downstream sides thereof having respective fluid communication with and exerting first and second pressures in end chambers defined by said faces, spring means in said second chamber biasing said piston means in a direction opposite to said first pressure, control conduit means in said housing intersecting said bore and having upstream and downstream ends relative to said bore, said upstream end of said control conduit means having fluid communication with said downstream side of said measuring throttle means, said piston means having edge means cooperable with downstream portion of said control conduit means to form variable control throttle means, discharge throttle means on the downstream side of said control conduit means, and a tapping for said control pressure in said control conduit between said variable control throttle means and said discharge throttle means.

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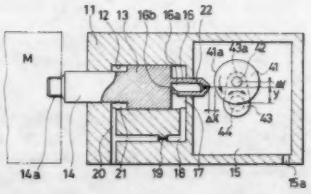
**4,388,942**

## NOZZLE FLAPPER VALVE

**Akio Mito, Yokohama, Japan, assignor to Tokyo Keiki Co., Ltd., Japan**

**Filed Jan. 16, 1981, Ser. No. 225,536**
**Claims priority, application Japan, Jan. 22, 1980, 55-6333[U]; Jul. 22, 1980, 55-103761[U]; Aug. 7, 1980, 55-112134[U]**
**Int. Cl.³ G05D *16/00***
**U.S. Cl. 137—85** **11 Claims**



1. A nozzle flapper valve comprising:

a cylindrical flapper (41) having a geometric center and a substantially cylindrical peripheral surface;
a first rotary shaft (44) connected to said flapper at a location eccentric to said geometric center for movement of said flapper;
rotating means connected to said first shaft for rotating said first shaft within a selected range;
a lever (43) connected to said first shaft, said flapper rotatably mounted to said lever about a second shaft, (42) connected to said lever;
a nozzle (22) having an axis intersecting said peripheral surface and spaced from said peripheral surface by a selected clearance (ΔX); and
said shaft being positioned and said selected range being chosen so that said geometric center of said flapper is eccentric with said axis of said nozzle by a distance (ΔY) and said clearance (ΔX) is established between said nozzle and said peripheral surface of said flapper.

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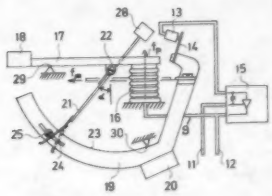
**4,388,943**

## LINKAGE FOR MOMENT BALANCING MEASURING APPARATUS

**Juhani Kukkula, Tampere, Finland, assignor to Valmet Oy, Finland**

**Filed May 6, 1981, Ser. No. 261,242**
**Claims priority, application Finland, May 21, 1980, 801651**
**Int. Cl.³ G05D** *16/00*
**U.S. Cl. 137—85** **9 Claims**




1. In a linkage for use in moment balancing measuring apparatus of the pneumatic type including first and second pivotally mounted levers, the linkage being adapted to be acted upon by a measuring force and a pneumatic force for balancing the linkage, the improvement comprising means for adjustably varying the leverage ratio of the linkage, i.e., the ratio of the pneumatic force to the measuring force, including a rod-like member having one end rotatably attached to said first lever of the linkage at an attachment point and first locking means for selectively securing said rod-like member to said second lever of the linkage in a particular position corresponding to a respective particular instance of measurement.

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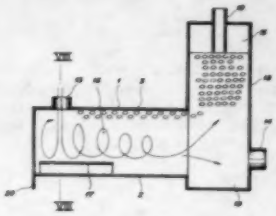
**4,388,944**

## DEVICE FOR CAPTURING AIR BUBBLES FROM FLUIDS IN PIPING

**Keizo Honma, No. 6, Nishi 15-chome, Minami 15 Jo, Chuo-ku, Sapporo, Japan, and Kunizo Honma, Sapporo, Japan, assignors to Keizo Honma, Sapporo, Japan**

**Filed Aug. 25, 1980, Ser. No. 181,192**
**Claims priority, application Japan, Aug. 30, 1979, 54-119453**[U]; Mar. 26, 1980, 55-38337
**Int. Cl.³ B01D** *19/00*
**U.S. Cl. 137—171** **1 Claim**

1. A device for separating air bubbles from a fluid flow and for silencing sound carried from the fluid flow into a pipe system which includes an inlet and an outlet pipe, consisting essentially of:
a hollow, substantially non-obstructed chamber having a longitudinal axis, which chamber is large in comparison with the cross-sectional measurement of the pipes in the system, said chamber having respective inlet and outlet ends and having an inlet opening at the inlet end and an outlet opening at the outlet end, the inlet pipe being connected to said inlet opening and the outlet pipe being connected to said outlet opening, said chamber further having an air capturing space protruding from the top of said chamber at a position nearer to said outlet end than to said inlet end, and a downwardly extending portion provided opposite said upwardly protruding air capturing space,




wherein said inlet opening is at the top of said chamber and directs the incoming fluid downwardly, transversely to the longitudinal axis of said chamber in an axial plane, and said chamber further includes a projection, which is substantially semi-circular in cross-section, projecting inwardly of said chamber, adjacent the wall of the chamber opposite said inlet opening, whereby incoming fluid is caused to strike against the wall of the chamber opposite said inlet opening and to swirl and flow in whirls toward said outlet end, thereby providing greater release of bubbles.

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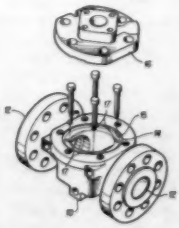
**4,388,945**

## VALVE ASSEMBLY AND DISASSEMBLY DEVICE

**David A. Johnson, Shrewsbury; Joseph B. Wright, Northboro, and Michael Pashoogian, Worcester, all of Mass., assignors to Jamesbury Corporation, Worcester, Mass.**

**Filed Jan. 4, 1982, Ser. No. 336,686**
**Int. Cl.³ F16K** *43/00, 25/00*
**U.S. Cl. 137—315** **8 Claims**



1. In a valve having a retractable valve seat, including a valve body having an inlet port, an outlet port and an upper opening, said upper opening including a plurality of superposed openings having different diameters with a land formed between each pair of openings, a cover for closing the upper opening, a valve member for controlling the flow of fluid between the inlet port and outlet port, said valve seat being in contact with the valve member and a central chamber between said inlet port and said outlet port for receiving said valve member, the improvement comprising:
means for retraction being formed of an elongated main section, a forward section and a rear section, said forward section including a camming surface for contacting said valve seat and having a variable diameter as well as a

constant diameter portion, said rear section being formed for receiving a force for moving the means for retraction; and

at least one of said lands having holes formed therein for receiving said means for retraction;

wherein said movement of the means for retraction causes the point of contact of said camming surface to change to a point having said constant diameter, forcing said seat to retract and remain retracted in a locked position by said constant diameter.

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**4,388,946**

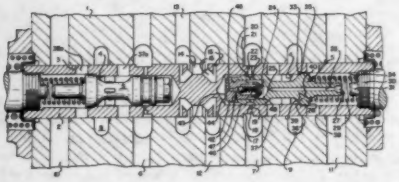
**VALVES**

**Rudolf Richter, Hosbach, and Walter Kropp, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany**

**Filed Apr. 20, 1981, Ser. No. 255,388**

**Int. Cl.³ F15B *11/04, 13/02***

**U.S. Cl. 137—596.2** **6 Claims**



1. A valve structure for preventing filling deficiency problems in a pressure energy consumer such as a double acting hydraulic piston comprising an elongate housing having a longitudinal bore, an elongate cylindrical spool slidable in said bore, a pair of spaced work chambers surrounding and communicating with said bore and adapted to be connected to opposite sides of said pressure energy consumer, at least one pressure chamber intermediate the end of said bore communicating therewith delivering pressure fluid to said bore, at least two exhaust chambers, adjacent the work chambers and adapted to be connected to a reservoir, a second bore in each end of said spool, a brake piston in each said second bore, a third bore in said brake piston adjacent one end, at least one transverse passage in the wall of said brake piston communicating between the second and third bores, resilient means in each such second bore in said spool acting on said piston at the end opposite the third bore normally to urge the same toward one end of said second bore in said spool, a pair of cooperating restrictor passage means, one in said spool and one in said piston communicating from the third bore to the piston end adjacent the resilient means connecting the interior of said spool with both ends of each second bore in the spool on opposite ends of the piston, passage means in the brake piston communicating from the restrictor passages in the spool to the end of the second bore opposite the resilient means, a pair of spaced transverse passages at each end of the spool communicating with each bore in the spool and spaced to connect a work chamber and pressure fluid chamber at one end of the spool and a work chamber and exhaust chamber at the other end of the spool in a work position, an annular groove in the brake piston intermediate its ends capable of connecting said spaced passages within the bore in the spool whereby in said work position pressure fluid flows from a pressure fluid chamber through said transverse passages to a work chamber at one end of the spool, and the pressure fluid from said pressure fluid chamber through said restricting passages, at least one transverse passage in the brake piston and the passage means in the brake piston to act on the brake piston to move it against the resilient means to position the groove between the passages at the other end of the spool to regulate flow of fluid between the work chamber and exhaust chamber in accordance with the relative pressure in the pressure fluid chamber.

**4,388,947**

**RAPID COUPLING WHICH IS OPERABLE EVEN UNDER PRESSURE**

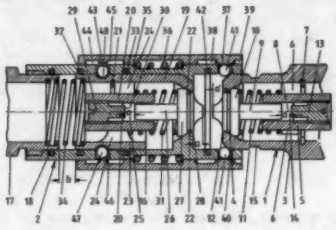
**Alfred Steuerwald, Orbis, Fed. Rep. of Germany, assignor to Aeroquip GmbH, Hann Münden, Fed. Rep. of Germany**

**Filed Feb. 11, 1981, Ser. No. 233,659**

**Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005490; Oct. 16, 1980, 3039072**

**Int. Cl.³ F16L *37/28***

**U.S. Cl. 137—614.06** **14 Claims**



1. Quick coupling which is operable even under pressure, particularly for hydraulic lines, comprising: two coupling halves which can be pushed into one another; first ball-locking means for locking said coupling halves in a coupled position, said coupling halves comprising a plug and a socket valve with a respective valve body which is urged in closing direction by closing springs and in the uncoupled position of the coupling halves maintained in closed position and guided in a star mounted in a coupling body, said plug and said socket each having a respective coupling body and a respective star body; one coupling half having a fixed abutment for limiting the stroke of the respective valve body in its open position, the respective valve body of the other coupling half performing a stroke equal to double the valve stroke of the respective other valve body, a displaceable abutment at the end of the single valve stroke and having second ball-locking means actuatable from the outside for releasing the double valve stroke respectively for locking said valve body in an open position corresponding to the single valve stroke, the star body of the coupling half having the double valve stroke being axially shiftable in said coupling body at least according to the single valve stroke, sleeve means coaxial with said coupling body for mounting said star body, said abutment being located between said sleeve means and the coupling body, and outside of fluid flow cross-section of the coupling.

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**4,388,948**

**ARTICULATED LOADING ARM FOR THE TRANSFER OF FLUIDS**

**Jean Carminati; Thomas Ehret, both of Malay le Petit; Gerard Ovieve, Sens, and Henry-Albert Thoor, Sens, all of France, assignors to FMC Corporation, Chicago, Ill.**

**Filed May 19, 1980, Ser. No. 150,831**

**Claims priority, application France, May 28, 1979, 79 13463; Jan. 23, 1980, 80 01430**

**Int. Cl.³ F16L *3/00***

**U.S. Cl. 137—615** **8 Claims**

1. An articulated drop-pipe assembly for connecting first and second fluid conduits of a boom-supported offshore loading system to a marine tanker, said assembly comprising:

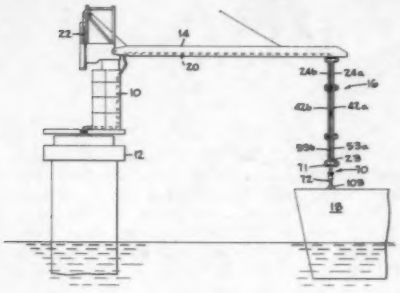
first and second upper pipe sections;

Cardan joint means pivotally connecting said first and second upper pipe sections to said first and second conduits, respectively, for movement of said assembly with respect to said conduits about two mutually perpendicular horizontal axes and for facilitating suspension of said assembly in a substantially vertical attitude from said first and second conduits when the loading arm is in either a horizon-

tal or non-horizontal attitude, said Cardan joint means comprising four pipe swivel joints with the first and second joints interconnecting the first conduit and the first upper pipe section, the third and fourth joints interconnecting the second conduit and the second upper pipe section, said first and fourth joints oriented on one of said horizontal axes, and said second and third joints oriented on the other of said horizontal axes;

first and second intermediate pipe sections;

means pivotally connecting said first and second intermediate pipe sections to said first and second upper pipe sections, respectively, for movement about at least two parallel horizontal axes;




means pivotally interconnecting said intermediate pipe sections for relative movement about a horizontal axis;

first and second lower pipe sections;

means pivotally connecting said first and second lower pipe sections to said first and second intermediate pipe sections, respectively, for movement about at least two parallel horizontal axes;

Cardan joint means connected to said first and second lower pipe sections to facilitate connecting said lower pipe sections to a pair of non-coaxial fluid conduits on a marine tanker; and

means suspended from said loading arm and connected to said lower pipe sections for supporting and vertically elevating said assembly.

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**4,388,949**

## MULTIPLE FOUR-WAY CONTROL VALVE

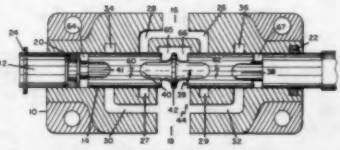
**Roland W. Bonney, R.F.D. 1, Box 65, Kennebunkport, Me. 04046**

**Continuation-in-part of Ser. No. 215,272, Dec. 11, 1980, Pat. No. 4,337,796. This application Dec. 4, 1981, Ser. No. 327,425**

**The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.**

**Int. Cl.³ F16K *11/07***

**U.S. Cl. 137—625.17** **3 Claims**



**1.** A multiple four-way control valve comprising:

a valve housing;

a cylindrical bore defined within said valve housing;

an inlet bore defined within said valve housing;

first and second pressure channels defined within said valve housing communicating with said inlet port and said cylindrical bore, to allow the entrance of hydraulic fluid into said cylindrical bore;

first and second pressure grooves defined around said cylindrical bore of said valve housing communicating with said first and second pressure channels respectively;

an outlet port defined within said valve housing;

first and second relief channels defined in said valve housing, extending from said inlet port through said valve housing to said cylindrical bore;

first and second relief grooves defined around the inside of said cylindrical bore in said valve housing communicating with said first and second relief channels;

a first series of operation ports of like diameter defined in said valve housing arrayed in a first transverse plane to the axis of, and communicating with, said cylindrical bore;

a second series of operation ports of like diameter defined in said valve housing arrayed in a second transverse plane to the axis of, and communicating with, said cylindrical bore;

a spool member positioned in said cylindrical bore and being rotatably and axially movable within said cylindrical bore;

a central spool projection member extending around and projecting from said spool member with its outer periphery contacting said cylindrical bore;

first and second collar members protruding from said spool member and contacting said cylindrical bore, each spaced equidistant from said central spool projection, the inner portions of said first and second collar members extending, when said spool member is in a neutral position, to block said first and second pressure channels and said first and second pressure grooves, and the outer portions of which extend beyond said first and second relief grooves and said first and second relief channels, said first and second collar members defining a first, second, third and fourth cutaway section around said spool at their respective inner portion ends and outer portion ends, said second and third cutaway sections being separated by said central spool projection;

first and second slots defined upon said first collar member and third and fourth slots defined on said second collar member, all in axial alignment, said first slot aligned with said first relief groove when said rotary spool is in a neutral position, said second slot aligned with said first pressure groove to empty said first pressure groove into said outlet chamber, said third slot positioned on said valve aligned with said second pressure groove to empty said second pressure channel into said outlet chamber; and said fourth slot aligned with said second relief groove;

seal means adapted to seal said spool in a fluid-tight relation in said housing within said cylindrical bore;

a second series of slots defined on said collar members to equalize pressure on said spool opposite each of said operation ports, each slot opposite one of said first, second, third and fourth slots with a plurality of cavities defined in the valve housing opposite each operation port, said cavities aligned with said second series of slots on said spool;

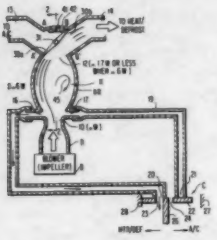
each of said slots in said first and second series of slots having a width of the diameter of one of said operation ports with its inside rear end terminating at a point contacting said cylindrical bore and its outside end opening into its respective cut-away section around said spool; and

said spool when in said neutral position blocks all of said operation ports, said spool if moved into an active position closes off one of said pressure channels by a land on one of said collars while directing the pressure through said slot on the other collar to a rotationally selected operation port while relieving pressure on a corresponding selected operation port of the other series by venting it through a slot on the other collar to said relief channel and to said outlet port.

## 4,388,950
## FLUID FLOW CONTROL ELEMENT HAVING MOVABLE VALVE AND METHOD

**Ronald D. Stouffer, Silver Spring, and Joseph W. Morris, Columbia, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.**

**Filed Dec. 9, 1980, Ser. No. 214,555**
**Int. Cl.³ F15C *3/00, 1/08***
**U.S. Cl. 137—829** **19 Claims**



1. In a fluid flow control element including a fluid amplifier including a chamber having an interaction region, a fluid flow inlet means and at least one control passageway adjacent said fluid flow inlet, a fluid flow outlet means downstream of, and substantially aligned with said fluid flow inlet,

a pair of load passageways branching at a branch point from said fluid flow outlet means,

a valve element,

pivot means mounting said valve element for rotation, by fluid flow forces of fluid flowing through said fluid flow inlet, at said branch point to direct fluid to flow through a selected one of said load passageways, the improvement wherein said fluid flow inlet, said fluid flow outlet means and the spacing between said inlet and outlet means are such that the fluid pressure in said chamber is always above any pressure in said load passageways and fluid can only flow from said chamber through the selected one of said load passageways and said at least one control passageway, whereby said valve element is rendered relatively insensitive to load conditions at said pair of load passageways,

and a control member for blocking flow of fluid through said at least one control passageway.

## 4,388,951
## WEAVING LOOMS HAVING ROTARY SHED FORMING DRUMS AND BEAT UP MECHANISMS THEREFOR

**Cyril M. Atkinson, Rothley, and Barry C. Strong, Syston, both of England, assignors to Bentley Weaving Machinery Limited, Loughborough, Leicestershire, England**

**Filed Sep. 15, 1980, Ser. No. 187,622**
**Claims priority, application United Kingdom, Sep. 27, 1979, 7933566**
**Int. Cl.³ D03D *47/00***
**U.S. Cl. 139—11** **12 Claims**

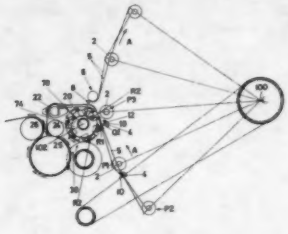
1. In a loom having a shed forming drum rotatable about a first axis, means for guiding warps around the drum to a fabric take-up mechanism, and means for inserting wefts into successive sheds as the drum rotates from a warp take-on position to a fabric take-up position, an improved beat-up mechanism including:

fixed cam means arranged on a second axis parallel to the first axis;

cage means having first annular portions extending around the second axis and second portions extending axially and interconnecting the annular portions, said cage means further have bar means pivotably mounted thereon, said bar means having beat-up elements and means for following said fixed cam means; and

means for rotating said cage means about the second axis in synchronism with the drum,

said cam means having a generally concentric portion which causes the cam following means of said cage means to extend the beat-up elements of said cage means generally radially and move wefts inserted on the drum to a fell, said cam means also having an inclined portion, the beat-up

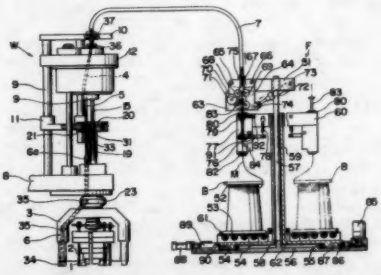


elements being pivoted radially inwardly with respect to said cage means contrary to the direction of rotary movement of said cage means when said cam following means is in contact with said cam means inclined portion to thereby move the beat-up elements clear of the fell after beating up whilst said cage means continues to rotate.

## 4,388,952
## COIL WINDING APPARATUS

**Takuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jan. 15, 1981, Ser. No. 225,247**
**Int. Cl.³ H02K *15/08*; B65H *81/00***
**U.S. Cl. 140—92.1** **8 Claims**



1. A coil winding apparatus comprising:

spool means for winding a wire therearound;

flyer means for effecting relative revolution around the spool means to wind the wire around said spool means;

continuous wire passage means for guiding the wire to the flyer means so as to feed the wire to said flyer means;

wire feeding means including a pair of rollers disposed at a starting end of said wire passage means to hold the wire in a radial direction and driving means operatively connected to said rollers for axially moving the wire through rotation of said rollers so as to drive the wire along said wire passage means;

opening and closing means for displacing said rollers approximately in the radial direction to control a state of contact therebetween with the wire;

a plurality of bobbins around which the wire is wound;

wire holding means for holding the end of the wire wound

around said bobbin in such a manner to permit axial movement thereof;
detection switch means for detecting presence or absence of the wire reaching the holding means; and
bobbin feeding means for positioning the bobbin under said wire feeding means in response to a signal from said detection switch means.

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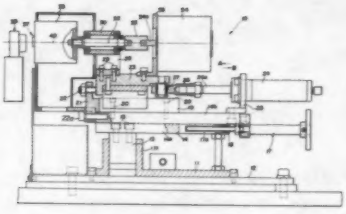
**4,388,953**

## METHOD OF AND APPARATUS FOR TWISTING WIRE END

**Akinori Hara, and Hiroshi Mochizuki, both of Akishima, Japan, assignors to Osawa Press Mdg., Co., Ltd., Tokyo, Japan**

**Filed Jan. 5, 1981, Ser. No. 222,658**
**Claims priority, application Japan, Jul. 30, 1980, 55-104574; Jul. 30, 1980, 55-107988[U]**
**Int. Cl.³ B21F *7/00***
**U.S. Cl. 140—149** **6 Claims**



1. Apparatus for stripping an end of an insulated wire which comprises:
(a) a horizontal base;
(b) a wire holder for holding the wire against movement;
(c) a carriage mounted on said base for horizontal movement along the axis of the insulated wire held by said wire holder;
(d) a cylindrical member mounted on said carriage for rotation about its axis, the axis of said cylindrical member lying on the axis of the wire held by said wire holder, said cylindrical member containing a wire support element and a stripper blade for cutting through the insulation of the wire end, said support element and said stripper blade being disposed on opposite sides of the axis of the wire held by said wire holder, and said support element and said stripper blade cooperating to hold the severed insulation upon movement of said carriage toward said wire holder;
(e) drive means mounted on said carriage and operatively connected to said cylindrical member for rotating it about its longitudinal axis; and
(f) actuator means mounted on said base and operatively connected to said carriage for horizontally moving it toward and away from said wire holder, whereby the wire end is stripped of the insulation and twisted as said carriage moves away from said wire holder.

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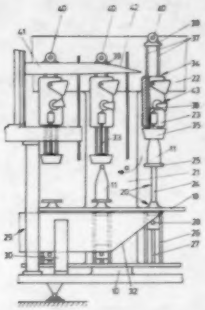
**4,388,954**

## ROTATING SINGLE OR MULTI-CHAMBER COUNTERPRESSURE FILLING MACHINES

**Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany**

**Filed May 15, 1981, Ser. No. 264,023**
**Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019381**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—39** **5 Claims**

1. A rotating single or multi-chamber counterpressure filling machine in combination comprising a plurality of filling elements, each of which is provided with:
a controlled pressurized gas valve arrangement having a valve unit and a control unit;
a centering device which includes a centering tulip supported by guided rods which are movable up and down, each centering device being individually controllable for holding and also for releasing operation therewith during circulation of the filling machine; and
a controllable arresting device for arresting said centering device in an upper position, and for releasing same, said arresting device effecting arresting of said centering device by engaging at least one of said rods thereof, at least one of said rods of said centering device being provided with at least one arresting recess, and in which said arresting device includes an arresting bolt which is mounted so as to be axially displaceable in said arresting device, and which is movable in and out of said at least one arresting recess in a controlled manner, said arresting device and said valve unit and control unit of said pressurized gas valve arrangement forming a structural unit, said arresting device being controllable in common with said pressurized gas valve arrangement, said valve unit and control unit of said pressurized gas valve arrangement including: a valve disc which is provided with openings and connecting conduits, and is rotatable into desired operating positions; and at least one control cam for actuating said arresting bolt.



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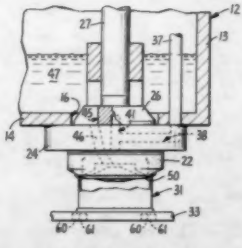
**4,388,955**

## VACUUM FILLER

**Konrad E. Meissner, Lafayette, and Grant R. Merritt, Livermore, both of Calif., assignors to Atlas Pacific Engineering, Company, Emeryville, Calif.**

**Filed Mar. 9, 1981, Ser. No. 241,484**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—286** **8 Claims**



1. In a vacuum filler for containers having a bowl containing filling liquid, a bottom valve attached to the underside of the bowl with a bottom valve seat including a through passage and a bottom valve plate in rotatable contact with the bottom valve seat to connect the through passage of the bottom valve seat in

sequence selectively to a source of vacuum, to filling liquid contained in the bowl and to atmosphere, a filling head attached to the underside of the bottom valve seat having a holder carrying a container seal and a displacement disc with an aligned through passage that is in communication with the interior of the container to be filled when it is in sealing engagement with the filling head, the improvement comprising a generally convex surface on the displacement disc facing the container contents and a continuous peripheral lip on the holder radially outward from and depending below the adjacent portion of said convex surface of the disc.

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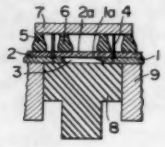
**4,388,956**

## METHOD OF PATCH MENDING A VENEER SHEET

**Katsuji Hasegawa, Ohbu, Japan, assignor to Mienan Machinery Works, Inc., Ohbu, Japan**

**Filed Feb. 20, 1981, Ser. No. 236,578**
**Int. Cl.³ B27G *1/00***
**U.S. Cl. 144—332** **9 Claims**




1. A method of patch mending a veneer sheet comprising the steps of

(1) laying a veneer sheet having a defective portion and a sheet of mending material one on top of the other;

(2) cutting through said veneer sheet and said sheet of mending material by a single stroke of a single annular cutting tool to cut off said defective portion from said veneer sheet and further to cut out a plug from said sheet of mending material;

(3) shifting said plug into a plane in which the veneer sheet extends while removing said cut-off defective portion from said veneer sheet; and

(4) removing said annular cutting tool from said sheet of mending material and said veneer sheet to leave said plug within the veneer sheet resulting in a patch mended veneer sheet.

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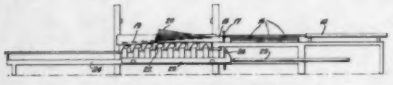
**4,388,957**

## MULTIPLE BLADE SPLITTING DEVICE

**Walter W. Schilling, Delta, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada**

**Filed Oct. 21, 1980, Ser. No. 199,183**
**Int. Cl.³ B27L *7/00***
**U.S. Cl. 144—366** **22 Claims**



1. An apparatus for splitting substantially straight grained lignocellulosic material substantially along grain lines into slabs, comprising:

means for advancing such material along a direction of travel;

a plurality of splitter blades, said blades being spaced along the direction of travel, and being laterally spaced apart in a stepped row from a first splitter blade located to commence splitting at one side of the material, to a last splitter blade located to finalize splitting at the opposite side of the material; and

compressible support means to support the material when advancing the material in the direction of travel and past said splitter blades, said support means permitting the material to move laterally away from the splitter blades and from the slabs being split therefrom in response to lateral forces created during splitting.

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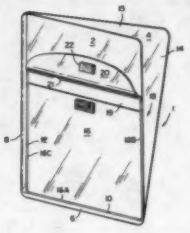
**4,388,958**

## FOLDER WITH POCKET

**Lawrence W. Dworkin, 24 White Oak Dr., North Caldwell, N.J. 07006**

**Filed Dec. 21, 1981, Ser. No. 333,028**
**Int. Cl.³ B65D *27/08***
**U.S. Cl. 150—7** **9 Claims**



1. A folder with pocket, comprising:

a relatively thick front sheet of a flexible material;

a relatively thick back sheet of a flexible material;

means for joining the bottom edges of the front and back sheets;

means for joining a side edge of the front sheet and a corresponding side edge of the back sheet;

the joined sheets forming a folder with an open side opposite the joined sides, an open top and a closed bottom;

a relatively thin flexible pocket member joined along its bottom and side edges to the external side of one of the front and back sheets, and extending partially along the length thereof for forming a pocket having an open top therewith; and

a relatively thin flexible closure member joined to the external side of the one of the front and back sheets relative to the pocket member for overlapping the pocket member upon closure, whereby a closable pocket is provided.

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**4,388,959**

## SOFT CONTAINER FOR JEWELRY

**Binns Handy, West Henrietta, and David O. Chase, Skaneateles, both of N.Y., assignors to Lenox, Incorporated, Lawrenceville, N.J.**

**Filed May 28, 1981, Ser. No. 267,862**
**Int. Cl.³ B65B *11/48*; B65D *65/04***
**U.S. Cl. 150—52 R** **9 Claims**

1. A pouch for storing precious items, such as jewelry and the like, comprising:

a pliable fabric member having a finish which is soft to the touch;

said fabric member having a triangular shape;

means defining an intermediate portion of said fabric member and including means for stiffening said intermediate portion relative to the remaining portion of said fabric member, whereby the sides of said intermediate portion defines fold lines along which said fabric member may be folded, thereby defining three triangular flaps, the adjacent ends of two of said fold lines being displaced from one another to provide a gap space;

a first closure member being affixed to said fabric member at the region of said gap space;

the remaining flap having a cooperating closure member affixed thereto, as to be releasably joined with said first

closure member when said third flap is in the closed position.

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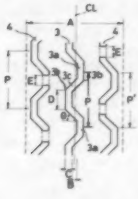
**4,388,960**

## MOTORCYCLE TIRE

**Makoto Wada; Koichi Iwasaki, and Hajime Nakata, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan**

**Filed Jun. 15, 1981, Ser. No. 273,421**
**Claims priority, application Japan, Jun. 13, 1980, 55-79725**
**Int. Cl.³ B60C *11/06***
**U.S. Cl. 152—209 R** **11 Claims**



1. A motorcycle tire having a first main groove circumferentially continuously formed in a central region of the tread portion and second main grooves formed of at least one run of unitary groove portions at each side of and with a space from said first main groove and having interrupted portions circumferentially at intervals to make the second main groove comprising unitary groove portions, said first main groove comprising a plurality of groove segments disposed circumferentially altenately at one and the other of two regions of the tread portion divided and lying close along the center line of the tread portion, said plurality of groove sections lying parallel to said center line and successively spaced in the circumferential direction of the tire, and a plurality of connecting groove segments extending across said center line and connecting together each adjacent two of said groove segments at their facing ends, the ratio of length of said interrupted portions to the pitch of repetition of said unitary groove portions being within the range of from 20 to 50%.

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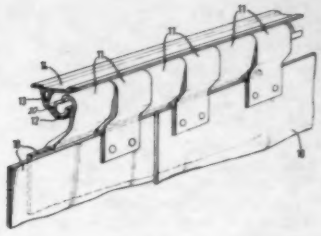
**4,388,961**

## STRIP-TYPE DOOR

**Horst Schaefer, Gomaringen-Stockach, and Hans Votteler, Reutlingen, both of Fed. Rep. of Germany, assignors to Albert Reiff KG, Reutlingen, Fed. Rep. of Germany**

**Filed Jan. 22, 1981, Ser. No. 227,409**
**Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039594**
**Int. Cl.³ A47H *1/00***
**U.S. Cl. 160—332** **3 Claims**

1. A strip-type door, comprising a plurality of individual strips having faces positioned to overlap each other, said strips being formed of plastic synthetic material and having upper rims; a series of swingable supports each including a recess to receive a respective upper rim of said strips and connected therewith; and a mounting element having a mounting portion secured to a lintel over the door opening, an arcuate wall portion, a channel spaced from the lintel and in part bounded by the arcuate wall portion and a supporting bar connecting said mounting portion with said arcuate wall portion, each of said supports including an upper section formed with an inwardly curved portion terminated with an end section of a spiral shape and insertable into said channel to form with said arcuate wall portion a hinge about which the supports can swing relative to said mounting element between a plurality of positions, a bent intermediate section and a lower section, said



intermediate section interconnecting said upper and lower sections, said lower section being provided with said recess, said arcuate wall portion of the mounting element having an edge being spaced from said mounting portion thereof at a predetermined distance, said inwardly curved portion of each of said supports having such a shape and outer dimensions that said inwardly curved portion of each of said supports may be inserted into said channel in only one of said positions in which the outer dimension of the inwardly curved portion is at most equal to said predetermined distance whereas the remaining outer dimensions of said inwardly curved portion are greater than said predetermined distance, to thereby prevent falling of said supports out of said channel when the strips are in their working swingable positions.

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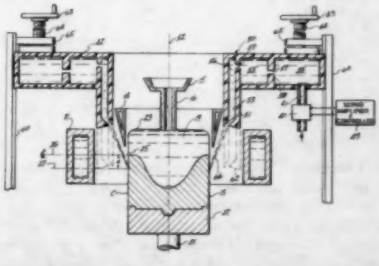
**4,388,962**

## ELECTROMAGNETIC CASTING METHOD AND APPARATUS

**John C. Yarwood, Madison; Ik Y. Yun, Orange, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Nov. 2, 1978, Ser. No. 957,420**
**The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.**
**Int. Cl.³ B22D *27/02***
**U.S. Cl. 164—455** **4 Claims**



1. In an apparatus for continuously or semicontinuously casting metals comprising:

means for electromagnetically forming molten metal into a desired casting and means for cooling said molten metal to form a shell of said casting by applying coolant directly to said casting; the improvement wherein, said apparatus further includes:

means for controlling the position of a solidification front at the outer surface of said casting, said means for controlling said position of said solidification front comprising means for providing a pulsed flow of coolant from said cooling means for said application directly to said casting, said means for providing said pulsed flow of coolant comprising an electrically operated valve adapted to control the flow of coolant to provide said pulsed flow and means connected to said valve for actuating said valve intermittently to provide said pulsed flow; and

said means for controlling said position of said solidification front further including means for changing the position of said means for applying coolant in order to change the position on said casting at which said coolant is applied.

3. In a process for continuously or semicontinuously casting metals comprising:

electromagnetically forming molten metal into a desired casting; and cooling said molten metal to form a shell of said casting by applying coolant with a cooling means directly to said casting; the improvement wherein, said process further includes:

controlling the position of a solidification front at the outer surface of said casting, said controlling step comprising providing a pulsed flow of coolant in said cooling step for said direct application to said casting;

said step of providing said pulsed flow of coolant comprising providing an electrically operated valve adapted to control the flow of coolant and actuating said valve intermittently to provide said pulsed flow; and

said step of controlling the position of said solidification front further including changing the position on said casting at which said coolant is applied to said casting by changing the position of said cooling means.

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**4,388,963**

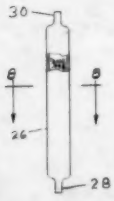
## THERMAL ENERGY STORAGE DEVICE AND METHOD FOR MAKING THE SAME

**Steve Campbell, Manchester, Mo., assignor to PSI Energy Systems, Inc., Fenton, Mo.**

**Division of Ser. No. 76,395, Sep. 17, 1979, Pat. No. 4,299,274, which is a continuation-in-part of Ser. No. 35,020, May 1, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 139,847**

**Int. Cl.³ F28D *17/00***

**U.S. Cl. 165—10** **10 Claims**




1. A method of filling and sealing a tube-like container with a phase change material to provide a thermal energy storage device which comprises taking the phase change material in liquid form and partially filling a vertically positioned open top thermo-plastic container constructed of high density polyethylene or the like sealed at a bottom end with said liquid phase change material and fusing by a pinch seal at one end of said container to seal the same, said container being constructed of high density polyethylene having a molecular weight of about 500,000 to 700,000.

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**4,388,964**

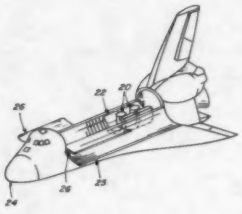
## THERMAL CONTROL SYSTEM

**David W. Almgren, Concord; John T. Bartoszek, Bolton; Robert M. Lucas, Melrose; Richard P. Berthiaume; Richard H. Spencer, both of Winchester, and William H. Saia, Danvers, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.**

**Filed Oct. 11, 1979, Ser. No. 83,972**

**Int. Cl.³ G05D *23/00***

**U.S. Cl. 165—32** **33 Claims**




1. A thermal control system associated with a payload in a space shuttle including a liquid flowing in a liquid loop and in heat exchange relationship with the payload and with a heat sink or source, the system comprising:

a variable speed pump for driving the liquid through the loop, the pump being energized in response to the temperature of the load and increased pump speed providing for increased heat transfer between the payload and the heat source or sink, the heat sink or source being a payload-mounted or pallet-mounted radiator or being thermally connected to a shuttle thermal control loop.

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**4,388,965**

## AUTOMATIC THERMAL SWITCH

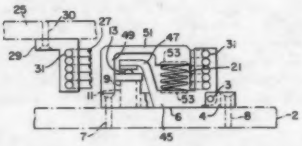
**Joseph W. Cunningham, Rockville, and Lawrence D. Wing, Bowie, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Dec. 21, 1979, Ser. No. 106,192**

**The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.**

**Int. Cl.³ G05D *23/00***

**U.S. Cl. 165—32** **12 Claims**




1. A thermal switch for selectively varying the heat transfer between two separate temperature environments, comprising:

first and second thermally conductive spaced members, respectively having surfaces exposed to two separate temperature environments;

a heat motor being in heat exchange relation with said first spaced member;

a thermally conductive switch saddle spatially separated from said second member and pivotally attached to said first member, said switch saddle being responsive to said heat motor so that said switch saddle is pivoted relative to

said first member between first and second positions in response to the amount of heat absorbed by said heat motor from said first spaced member, said switch saddle in direct contact and providing a high thermal conductivity contact joint with only said first one of said spaced members when in said first position and said switch saddle being spaced from said first spaced member thereby opening only said high thermal conductivity contact joint when in said second position; and

flexible heat carrier means thermally coupled to said switch saddle and to said spaced member for completing a flexible, fixed conductive heat transfer path between said switch saddle and second spaced member.

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**4,388,966**

## BURIED HEAT EXCHANGER

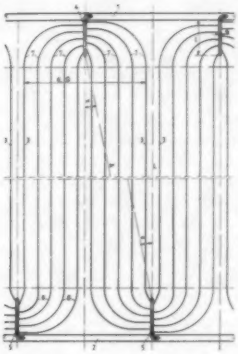
**Werner Spiegel, Essen, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany**

**Filed Dec. 11, 1981, Ser. No. 329,938**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048798**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 165—45** **18 Claims**



**1.** A horizontal inground heat exchanger comprising:

an input line;

a return line;

a plurality of heat exchange pipes disposed substantially in a plane and substantially equidistantly spaced from each other, said pipes being assembled into a plurality of groups of a a plurality of pipes each;

an input manifold connected to one end of at least some of the pipes in each group; and

a return manifold connected to an opposite end of at least some of the pipes in each group;

each input manifold connected to said input line and each return manifold connected to said return line;

said input and return manifolds each having a cross sectional dimension which is small with respect to a crosswise dimension of each group in the plane;

each pipe having a curved end portion connected to a respective input and return manifold.

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**4,388,967**

## SOLDERABLE MOUNTING STAKES FOR HEAT SINKS

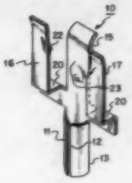
**Leonard S. Breese, Duncanville, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.**

**Filed Sep. 2, 1980, Ser. No. 183,240**

**Int. Cl.³ F28F** *7/00, 9/00*

**U.S. Cl. 165—80 B** **7 Claims**

**1.** A solderable stake for a heat sink comprising a unitary body formed from an essentially flat rectangular metal body, said body having a pair of cuts extending from opposite edges thereof aligned substantially along a common axis and the portion of the body on one side of said axis folded to form a shank; a base portion transverse to the axis of said shank supported by said shank; a further portion of said body having further cuts extending from the edge opposite said shank along lines substantially parallel with said shank to form a plurality of parallel fingers extending from said base substantially parallel




with the axis of said shank but disposed on the opposite side of said base from said shank with said shank and said fingers extending in opposite directions from said base, at least one of said fingers being displaced from the remaining fingers to form therewith and said base a channel adapted to receive a heat sink; and a solderable coating on at least the shank portion of said unitary body.

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**4,388,968**

## DOWNHOLE TOOL SUCTION SCREEN ASSEMBLY

**John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

**Division of Ser. No. 255,252, Apr. 17, 1981, Pat. No. 4,366,862, which is a continuation of Ser. No. 204,057, Nov. 4, 1980, Pat. No. 4,327,387, and Ser. No. 204,058, Nov. 4, 1980, each is a division of Ser. No. 57,093, Jul. 12, 1979, Pat. No. 4,246,964.**

**This application Aug. 26, 1982, Ser. No. 411,727**

**Int. Cl.³ E21B** *33/124, 33/127, 43/08, 49/08*

**U.S. Cl. 166—236** **8 Claims**

**1.** A screen assembly for a downhole pump, said screen assembly comprising:

a top screen assembly adapter means, having an internal threaded portion, for threadedly connecting said screen assembly to a lower end of said downhole pump;

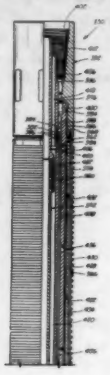
a lower screen assembly adapter means, having an external threaded portion, for threadedly connecting said screen assembly to an apparatus located therebelow;

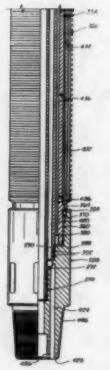
a tubular screen mandrel connected between said top and lower screen assembly adapter means;

a cylindrical pump screen disposed about an outer surface of said screen mandrel, said pump screen having upper and lower ends retained in annular grooves of said top and lower screen assembly adapter means, respectively;

a discharge passage means, disposed in said screen assembly, for communicating a discharge of said downhole pump with a lower end of said lower screen assembly adapter means; and

a suction inlet passage means, disposed in said screen assembly, for communicating said outer surface of said screen





mandrel with an intake of said downhole pump through said top screen assembly adapter means.

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**4,388,969**

**BOREHOLE PIPE SIDE ENTRY METHOD AND APPARATUS**

**Gailen Marshall, Houston; C. H. Myska, Sugar Land, and Kenneth E. Smith, Houston, all of Tex., assignors to NL Industries, Inc., New York, N.Y.**

**Filed Dec. 1, 1980, Ser. No. 211,614**

**Int. Cl.³ E21B *17/00***

**U.S. Cl. 166—242** **10 Claims**

1. An apparatus for facilitating entry of a small diameter tubular member from the exterior to the interior of a pipe string in a borehole, comprising

a housing arranged for coupling in said pipe string; said housing having a longitudinal bore communicating with the bore of said pipe string;

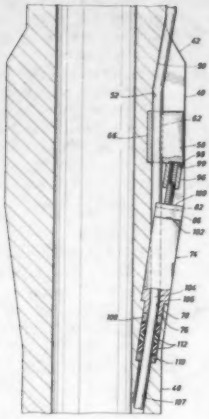
a means forming a recess in the wall of said housing;

a passage means in said recess means and communicating between the interior and exterior of said housing for passing said tubular means therethrough;

a seal means arranged in said passage means for encircling said tubular member;

a first retainer means on one side of said passage means for fixedly retaining one side of said seal means, said retainer means being movable between fixed positions;

a second retainer means on the other side of said seal means; and



an adjustable jack means positioned in said recess for moving said first retainer means between fixed positions.

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**4,388,970**

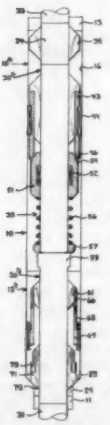
**APPARATUS AND METHOD FOR CONTROLLING INJECTION FLUID FLOW IN A WELL ANNULUS**

**John R. Setterberg, Jr., Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.**

**Filed Feb. 20, 1981, Ser. No. 236,144**

**Int. Cl.³ E21B *23/00***

**U.S. Cl. 166—382** **16 Claims**



1. Injection fluid control apparatus, for use in a producing well which includes a string of casing and a string of production tubing, comprising

a tool housing to be run into the well comprising a tubular member having a polished bore in one portion and having an internal locking profile in another portion;

a tool mandrel to be run into said casing comprising a tubular member having external, longitudinally spaced, spacer members to provide axial flow paths between said tool housing and said tool mandrel;

a tubular packing mandrel mounted on said spacer members

carrying external annular packing means for sealing engagement with said polished bore of said tool housing; said packing mandrel having means at one end thereof defining an annular valve seat;

a tubular valve closure member mounted for axial sliding movement on said tool mandrel, having means at one end thereof defining an annular valve closure for coacting sealing engagement with said valve seat; said closure member carrying internal annular packing means for sealing engagement with said tool mandrel;

and locking means mounted on said tool mandrel for coacting engagement with said locking profile, to limit axial movement of said tool mandrel relative to said tool housing.

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**4,388,971**

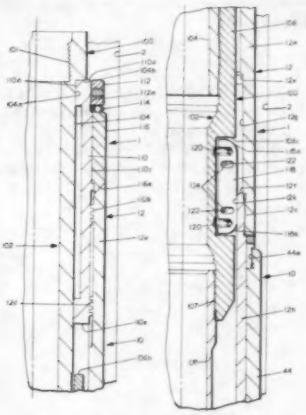
## HANGER AND RUNNING TOOL APPARATUS AND METHOD

**Elmer R. Peterson, Wilmington, Calif., assignor to Baker International Corporation, Orange, Calif.**

**Filed Oct. 2, 1981, Ser. No. 307,906**

**Int. Cl.³ E21B *23/06***

**U.S. Cl. 166—387** **22 Claims**



**1**. The method of setting a conduit gripping tool by a running tool on a threadably connected work string, insertable within a subterranean well, comprising the steps of:

1. running the conduit gripping tool to a desired position in the well on the running tool;
2. rotating the running tool and a portion of the conduit gripping tool in the same direction as the hand of the work string threaded connections, thereby releasing the conduit gripping tool for setting;
3. applying an axial force to the conduit gripping tool to set same in gripping relation to the conduit; and
4. rotating the running tool relative to the entire conduit gripping tool in the same direction as the hand of the work string threaded connections to release the running tool from the conduit gripping tool.

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**4,388,972**

## VIBRATIONLESS IMPACT TOOL

**Per A. L. Gidlund, Täby, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden**

**Filed Apr. 21, 1981, Ser. No. 256,148**

**Claims priority, application Sweden, Apr. 25, 1980, 8003177**

**Int. Cl.³ B25D *17/24***

**U.S. Cl. 173—162 R** **7 Claims**

**1**. A vibrationless pneumatic impact tool comprising:

a housing;

a cylinder axially displaceable in said housing;

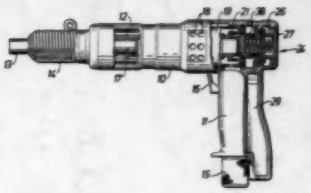
a hammer piston reciprocably driven by pressure air in said cylinder;

a recoil cushioning air volume disposed between said housing and said cylinder;

a first valve means located in a fixed disposition relative to said housing;

a second valve means located in a fixed disposition relative to said cylinder and arranged to cooperate with said first valve means;

said first valve means comprising at least one air inlet opening communicating with a pressure air source and at least one air venting port communicating with the atmosphere;



said second valve means being arranged to selectively prevent communication between said at least one inlet opening and said air volume while establishing communication between said at least one venting port and said air volume when said cylinder is in its extreme forward position relative to said housing, and to selectively establish communication between said at least one inlet opening and said air volume while preventing communication between said at least one venting port and said air volume when said cylinder is in its extreme rear position relative to said housing.

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**4,388,973**

## DIRECT DRILL BIT DRIVE

**Siegfried Winkelmann, Tettnang, and Horst Schulz, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany**

**Filed Mar. 31, 1981, Ser. No. 249,724**

**Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012779**

**Int. Cl.³ E21B *4/02***

**U.S. Cl. 175—321** **8 Claims**

**1**. A direct-drive drill string comprising:

an upper tubular drive section provided with a drive motor having a shaft and adapted to be traversed and driven by a flushing liquid;

a gear section below said drive section and provided with gearing driven by said shaft and formed with an output member;

a bearing section below said gear section, a plurality of radial bearings rotatably journaling said inner tube, all of said sections having a non-rotating outer tube, a rotating inner tube in at least said bearing section, and radial bearings disposed between said inner and said outer tubes, at least one of said radial bearings having inner and outer races of which one is axially elongated to accommodate axial movement of said inner tube relative to said outer tube;

a drill bit connected to said inner tube below said bearing section and rotatably entrained by said inner tube;

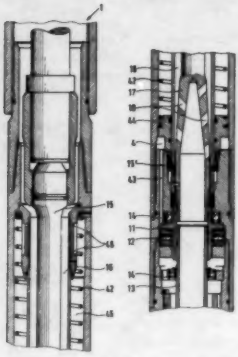
means defining an annular space between said inner and outer tubes intermediate said drive section and said gear section;

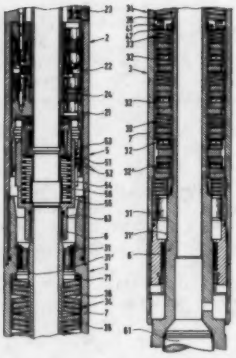
means for introducing oil into said annular space whereby said annular space serves as an oil reservoir;

at least one axial bearing in contact with oil from said reservoir for receiving axial force generated by said motor upon the operation thereof by said liquid;

means for angularly coupling the inner tube connected to said bit with said output member of said gearing so as to permit axial displacement of the inner tube carrying said bit within said outer tube;

spring means braced between said inner tube carrying said bit and said outer tube for yieldably resisting axial displacement of said inner tube carrying said bit; and





further axial bearings cooperating with said spring means and the inner tube carrying said bit for enabling rotation of said inner tube carrying said bit while spring force is applied thereto, said flushing liquid passing through said inner tube to said bit.

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**4,388,974**

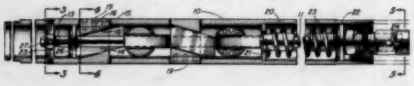
## VARIABLE DIAMETER DRILL ROD STABILIZER

**Emrys H. Jones, Jr., and Pramod C. Thakur, both of Morgantown, W. Va., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Apr. 13, 1981, Ser. No. 253,462**

**Int. Cl.³ E21B *7/08***

**U.S. Cl. 175—325** **3 Claims**



1. A variable diameter drill rod stabilizer for use in a drilling operation comprising:

(a) an outer housing adapted to attach to and become a part of a drill rod string;

(b) a piston within said housing, said piston having a flow passage therethrough, a flow passage outlet, and being capable of limited axial movement within said housing;

(c) a plurality of cam members including cam surface means axially positioned along said piston;

(d) a plurality of borehole wall engaging members contained in said housing and including cam follower surfaces associated with said cam surface means whereby said wall engaging members move from a contracted position to an expanded position beyond the outer surface of said housing in response to axial movement of said piston;

(e) bias means adapted to prevent forward movement of said piston within said housing in response to a first lower pressure drop of fluid flowing through said flow passage and to allow forward movement of said piston within said housing in response to a second higher pressure drop of fluid flowing through said flow passage; and

(f) a piston stop member including longitudinal flow passage means therethrough, said stop member being downstream from the outlet of the flow passage through said piston when said stabilizer is in the contracted position and upstream from said stop member when said stabilizer is in the expanded position.

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**4,388,975**

## COMBINATION WEIGHING DEVICE

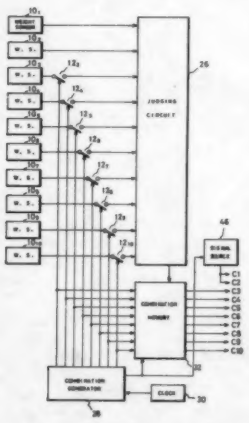
**Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan**

**Filed May 12, 1981, Ser. No. 262,927**

**Claims priority, application Japan, May 13, 1980, 55-63132**

**Int. Cl.³ G01G *19/04*; B07C *5/16***

**U.S. Cl. 177—25** **4 Claims**



1. A combination weighing device, comprising a plurality of weighing balances for producing electric signals indicative of their measured weights, respectively; an arithmetic unit having a plurality of inputs for summing the incoming signals to produce an output when the resultant sum falls within a predetermined range; a plurality of normally-open switches coupled respectively between said weighing balances and the inputs of said arithmetic unit and having a control terminal each; switch control means having a plurality of output terminals coupled respectively to the control terminals of said normally-open switches for applying control signals thereto from the output terminals selected successively in accordance with predetermined combinations; and means coupled to said switch control means and said arithmetic unit for supplying a combination of said control signals to associated equipments of corresponding

ones of said weighing balances in response to the output of said arithmetic unit; and means for always supplying the output signal or signals of at least a predetermined one or more of said weighing balances to said arithmetic unit.

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**4,388,976**

## RESILIENT MOUNTING FOR ENGINE ENCLOSURES

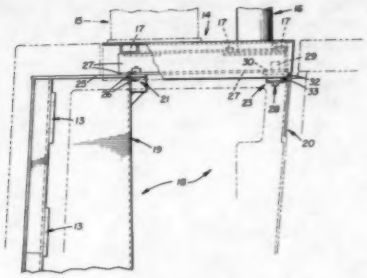
**Hugh K. Williams, Davenport, Iowa, and Jerome A. Thies, Geneseo, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US80/00883, § 371 Date Oct. 6, 1980, § 102(e) Date Oct. 6, 1980, PCT Pub. No. WO82/00275, PCT Pub. Date Feb. 4, 1982**

**PCT Filed Jul. 14, 1980, Ser. No. 273,895**

**Int. Cl.³ B62D** *25/12*

**U.S. Cl. 180—69 R** **1 Claim**



1. A construction vehicle (10) having a frame (18), an engine enclosure (11), a hood assembly (14) mounted on said engine enclosure (11), said engine enclosure (11) including a first structural member (32) and said hood assembly (14) including a second structural member (30) mounted in sliding contact directly on said first structural member (32), first mounting means (21) for fixedly securing a first end (22) of said hood assembly (14) on said engine enclosure (11) to prevent relative movement therebetween, and second mounting means (23) for attaching an opposite, second end (24) of said hood assembly (14) on said engine enclosure (11) to permit limited fore and aft and cushioned upward movements of the second end (24) of said hood assembly (14) relative to said engine enclosure (11), said second mounting means (23) including an internally threaded boss (29) secured on said second structural member (30), a bolt (28) extending through said first structural member (32) and threadably secured to said boss (29), and an elongated slot (31) formed though said first structural member (32), said boss (29) extending through said slot (31) to permit limited fore and aft movement of said second structural member (30) relative to said first structural member (32).

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**4,388,977**

## ELECTRIC DRIVE MECHANISM FOR VEHICLES

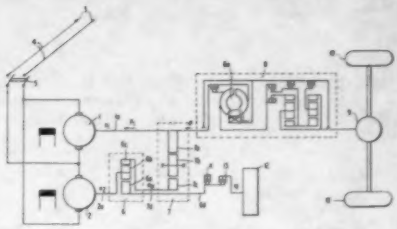
**Christian Bader, Böblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Apr. 24, 1981, Ser. No. 257,427**

**Int. Cl.³ B60K** *9/04*

**U.S. Cl. 180—165** **25 Claims**

1. An electrical drive mechanism for a vehicle comprising, a drive mechanism adapted to be fed with electrical energy from an electrical main supply means and including an energy storage means in the form of a flywheel, at least two electrical motors adapted to be switched from a prime mover mode of operation to a generator mode of operation and being effective as a Ward-Leonard drive during a flywheel operation, a first of said drive motors being adapted to provide about one half of a maximum drive power for the vehicle, a second of said drive motors being adapted to provide about one half of the maximum drive power for the vehicle, means for electrically connecting said first and second motors in parallel during operation of the vehicle from the electrical main supply means, first transmission means for connecting the drive shaft of said first motor with driven wheels of the vehicle, second transmission means having an input connected to the drive shaft of said second motor and an output connected to said flywheel, third transmission means interconnected between the output of said



second transmission means and the drive shaft of said first motor, and selectively actuatable clutch means interposed between the output of said second transmission means and said flywheel.

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**4,388,978**

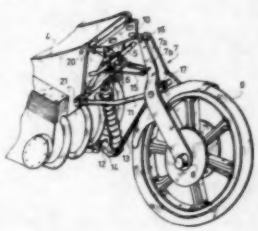
## SUSPENSION SYSTEM FOR CYCLES AND IN PARTICULAR FOR MOTORCYCLES

**Claude Fior, 12, avenue de l'Adour, Nogaro 32110, France**

**Filed Jan. 30, 1981, Ser. No. 230,017**

**Int. Cl.³ B62K** *25/04*

**U.S. Cl. 180—219** **14 Claims**



1. A vehicle suspension system adapted for suspending the chassis of a cycle, such as a motorcycle or like vehicle, said system comprising:

(a) a support frame, said support frame being adapted to receive a front wheel axle at the lower portion thereof, said support frame being movably mounted with respect to said chassis, both in the longitudinal median plane of said cycle as a result of movement of said suspension system as well as in rotation around an axis for purposes of steering said cycle;

(b) control means for controlling the position of said support frame in the longitudinal median support plane, said control means positioned between said chassis and said support frame and being adapted to guide the displacement of said support frame in said longitudinal median support plane during movement of said suspension system, said control means being further adapted to guide said front wheel axle relative to said chassis along a trajectory having an ascending rearwardly directed portion, a substantially vertical intermediate portion, and an ascending frontwardly directed portion, said trajectory having a convexity directed rearwardly towards said chassis;

(c) shock absorber means positioned to elastically maintain said support frame with respect to said chassis in said longitudinal median plane whereby said wheel axle moves along said trajectory, said trajectory being determined by said control means as a function of the forces being exerted on said cycle; and

(d) an independent mechanical element connecting the support frame to handlebars whose orientation is controllable, said independent mechanical element being independent of said control means and being adapted to control the rotational position of the support frame around its axis without movement of said control means.

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4,388,979

## MOTORCYCLE POWER TRAIN ARRANGEMENT

Josef Fritzenwenger, Anzing, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

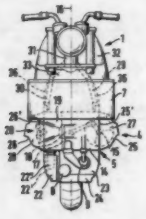
PCT No. PCT/EP80/00005, § 371 Date Oct. 1, 1980, § 102(e) Date Oct. 1, 1980, PCT Pub. No. WO80/01555, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 28, 1980, Ser. No. 243,950

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903742

Int. Cl.³ B62K *11/04*

U.S. Cl. 180—226 4 Claims



1. A motorcycle power train arrangement comprising a liquid cooled engine block and a transmission case, substantially exposed and mounted symmetrically to the longitudinal median plane of the motorcycle, largely filling the space between the front wheel and the rear wheel, and including a liquid coolant radiator mounted essentially above the engine block in substantially vertical position transversely to the direction of travel, a plurality of parallel cylinders being arranged transversely and a crankshaft longitudinally to the direction of travel, the transmission case being located adjacent the engine block, and a valve chamber cover forming to one side an outer longitudinal limit of the power train, a crank space cover forming an outer longitudinal limit of the power train on the other side; and wherein the cylinders are located on said one side of engine block in a single line; the crankshaft is located on said other side of the engine block and is spaced from and parallel to the longitudinal median plane, and in that said covers for the valve chamber and crank space form on both sides symmetrical outer longitudinal limits of the power train; a portion of an exhaust system on said one side, and of a crankcase on said other side, are below and adjacent to said covers, but less wide and substantially symmetrical.

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4,388,980

## OPERATOR RESTRAINT FOR A LOADER

Michael A. Vig, and Donald K. Schmidt, both of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 26, 1981, Ser. No. 228,535

Int. Cl.³ B60R *21/10*

U.S. Cl. 180—271 9 Claims

1. A loader including:

a power operated working implement;

a control apparatus having a plurality of operative positions for supplying power to the working implement and at least one neutral position where power is not supplied to the working implement, the control apparatus capable of manipulation by the operator of the loader for placing the control apparatus in any one of the operative or neutral positions;

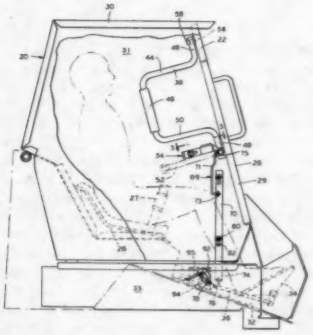
a cab portion having a front opening for operator entrance and egress;

an operator position from which the operator may manipulate the control apparatus, the operator position being located in the cab portion;

the control apparatus including at least one control linkage operating between an operator's foot pedal and a hydraulic control for supplying the power to the working implement;

an operator restraint bar having two ends, at one of its ends the restraint bar is pivotally connected to the cab portion adjacent the front opening for swinging movement between a protect position for securing the operator during rough ride conditions and a passage position spaced from the protect position where the operator can enter or leave the loader;

a locking assembly for selectively locking the control apparatus in a neutral condition, the locking assembly being in locking engagement with the control apparatus when the restraint bar is in its passage position;



the locking assembly including a locking member connected with the restraint bar, the locking member having a lower end that is moved downwardly when the restraint bar is moved from its passage position to its protect position and moved upwardly when the restraint bar is moved from its protect position to its passage position;

a crank in operative association with the locking member and movable in a downward direction in response to downward movement of the locking member and movable in an upward direction in response to upward movement of the locking member;

a crank shaft connected to the crank and rotatable in a first rotative direction in response to downward movement of the crank and rotatable in a second rotative direction in response to upward movement of the crank; and

a member mounted on the crank for rotation therewith, the member having a selectively engageable means for locking engagement with the control linkage, the locking means being in engagement with the control linkage when the restraint bar is in its passage position.

**4,388,981**

## VARIABLE CYLINDER HYDRAULIC VIBRATOR AND CONTROL SYSTEM

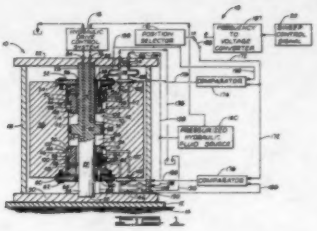
**Delbert W. Fair, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.**

**PCT No. PCT/US79/00592, § 371 Date Feb. 23, 1981, § 102(e) Date Feb. 23, 1981, PCT Pub. No. WO81/00461, PCT Pub. Date Feb. 19, 1981**

**PCT Filed Aug. 8, 1979, Ser. No. 289,958**

**Int. Cl.³ G01V *1/14***

**U.S. Cl. 181—119** **6 Claims**



1. Apparatus for incremental cylinder length control in a hydraulic vibrator of the type having a vibrating reaction mass with a cylinder bore disposed therein, comprising:

first end sleeve means disposed in sealed, movable position in one end of said cylinder bore;

second end sleeve means disposed in sealed, movable position in the other end of said cylinder bore and defining a cylinder of predetermined length between said end sleeve means;

piston rod means sealed and slidably disposed through said first and second end sleeve means and including a piston disposed in said cylinder bore;

hydraulic means for selectively positioning said first and second end sleeve means to adjust said cylinder bore length incrementally;

sensor means disposed adjacent said end sleeve means to generate a sleeve position signal;

control selection means generating a reference signal;

means comparing said position and reference signal for generating an error signal for controlling said hydraulic means; and

means for hydraulically actuating said piston for reciprocation within said cylinder thereby to impart vibration to said reaction mass.

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**4,388,982**

## FOOTHOLD DEVICE

**Yoshihiro Yonahara, 255-4, Oaza Iida, Omiya-Shi, Saitama, 330, Japan**

**PCT No. PCT/JP79/00315, § 371 Date Jul. 9, 1980, § 102(e) Date Jul. 9, 1980, PCT Pub. No. WO80/01298, PCT Pub. Date Jun. 26, 1980**

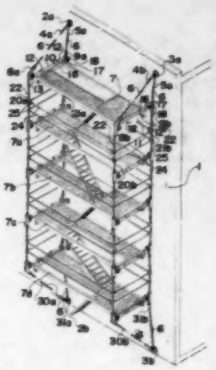
**PCT Filed Dec. 12, 1979, Ser. No. 202,442**

**Claims priority, application Japan, Dec. 12, 1978, 53-171277**

**Int. Cl.³ E04G *3/10*; B63B *9/06***

**U.S. Cl. 182—82** **2 Claims**

1. The scaffold for attachment to a building wall or the like having two pair of attachment fittings spaced laterally from each other, each pair of attachment fittings having an upper member and a lower member spaced vertical from each other, comprising two pair of chains, the chains of each pair being securable to the upper and lower members of an associated pair of fittings, a plurality of platforms located between the respective chains of each pair in vertically spaced intervals, means for attaching each of said platforms to each of said chains comprising a bracket located on each chain at a position corresponding to the interval of said platform, a rod extending between the corresponding brackets of each pair of chains, and hook means located along the side edges of said platform and engaging over said rods, the brackets located on the corresponding chain of each pair of chains being provided with means for adjusting the horizontal level of said rod to thereby adjust the level of said platform and means for adjusting the length of said chains



located in that portion of each of said chains above the uppermost platform and below the lower most platform whereby on securing said chains to said fitting said chains may be placed under tension forming a rigid scaffold secured to said wall.

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**4,388,983**

## LIGHTWEIGHT LADDER

**Leroy R. Bartels, Hager City, Wis., and Arnold M. Milbright, Red Wing, Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Jan. 25, 1982, Ser. No. 342,149**

**Int. Cl.³ E06C *1/36, 1/06***

**U.S. Cl. 182—189** **10 Claims**

1. A ladder for use or a structure having vertically spaced apart retaining clips, said ladder comprising:

a vertical member;

a plurality of rungs on said vertical member;

a leg extending substantially horizontal to said member; and

a downwardly extending foot coupled to said leg and adapted to engage one of said retaining clips; said foot having a first portion substantially parallel to said vertical member for engaging the surface of said structure, and a second portion forming an angle with said first portion

whereby when said first portion engages said structure, said second portion engages said clips.

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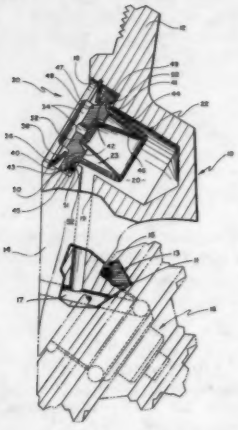
**4,388,984**

## TWO-STAGE PRESSURE RELIEF VALVE

**Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.**

**Filed Feb. 9, 1981, Ser. No. 232,936**
**Int. Cl.³ E21B *9/08*; E16C *33/74***
**U.S. Cl. 184—54** **9 Claims**



6. A sealed lubricated rotary rock bit comprising:

a bit body having at least one leg extending downwardly therefrom, said leg having a journal pin for rotatively supporing a roller cutter, and a seal between the rolling cutter and the journal pin,

a lubricant reservoir in the bit body communicating with a bearing area formed between the roller cutter and the journal pin,

a radially extending annular seat formed in the bit body around the reservoir,

a cover cap including an annular flange overlapping the annular seat,

a pressure compensator in the lubricant reservoir comprising a resilient membrane separating the reservoir into a lubricant region within the bit body and a drilling fluid region exterior to the bit body and including a flexible flange of said resilient membrane between the annular flange of the cover cap and the annular seat formed in the bit body for sealing against the annular seat, and characterized by:

means for relieving differential lubricant pressure around the resilient membrane to the exterior of the bit body comprising:

at least one cavity in the annular flange of the cover cap in communication with the exterior of the bit body, and

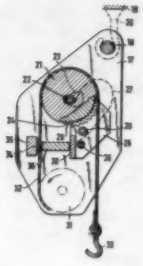
a surface on the flexible flange on the resilient membrane exposed to such a cavity, the opposite surface of the flexible flange of the resilient membrane adjacent the annular seat in said body being in communication with the lubricant region whereby a portion of the flexible flange of the resilient membrane can be diverted into such a cavity by excess differential lubricant pressure from within the reservoir, the differential pressure thus being relieved past the flexible flange and annular seat adjacent such cavity.

**4,388,985**

## BRAKING-AND/OR BLOCKING DEVICE FOR LOAD CARRYING FLEXIBLE PULLING MEANS, FOR EXAMPLE, BELTS OR ROPES

**Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany**

**Filed Dec. 9, 1980, Ser. No. 214,759**
**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950470**
**Int. Cl.³ B65H *59/14***
**U.S. Cl. 188—65.4** **10 Claims**



1. Device for braking or blocking of load carrying flexible pulling means, such as belts or ropes, comprising a braking roller partly wrapped by the load carrying flexible pulling means and which can move with respect to a clamping surface when said pulling means exerts a tangential force on the braking roller, a non-rotating member with said clamping surface disposed adjacent the pulling means near the braking roller, said clamping surface providing the only contact surface between the non-rotating member and the pulling means, and braking roller movement effecting clamping of the pulling means against said clamping surface, wherein braking friction between the rolling surface of said braking roller when arrested and said pulling means is such that a force moment is acting between the braking roller and the clamping surface which is sufficient to clamp the pulling means without slippage.

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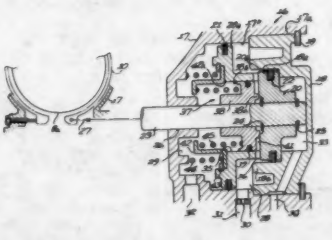
**4,388,986**

## SPEED CHANGE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

**Mitsuo Umezawa, Akikawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 10, 1981, Ser. No. 252,767**
**Claims priority, application Japan, Jun. 4, 1980, 55-78612[U]**
**Int. Cl.³ F16F *49/12***
**U.S. Cl. 188—77 R** **11 Claims**



1. A speed change control system for an automatic transmission having a planetary gear mechanism, and a brake band engageable with a brake drum for altering the transmission ratio, comprising

a body defining a cylindrical chamber,
a servo-piston having an axial bore and slidably engaged in said cylindrical chamber,
a piston rod secured to said servo-piston and to said brake band,
an accumulator piston slidably disposed in said axial bore,
a first spring means provided between said servo-piston and an inner wall of said cylindrical chamber of said body for returning said servo-piston in a direction, opposite to a direction of engagement of the brake band with the brake drum, for releasing said brake band,
a second spring means operatively connected between said accumulator piston and said servo-piston for biasing said accumulator piston,
said servo-piston in cooperation with said cylindrical chamber defining apply side and release side oil chambers respectively on opposite sides of said servo-piston,
said accumulator piston on one side thereof in cooperation with said axial bore defining an accumulator oil chamber,
said body is formed with ports communicating with said apply side and release side oil chambers, respectively,
passage means for communicating said apply side oil chamber with said accumulator oil chamber, and
means for engaging said accumulator piston with said servo-piston after the accumulator piston moves a predetermined stroke in said direction of engagement of the brake band against said second spring means, said accumulator piston in cooperation with said first and second spring means, said servo-piston and said passage means constituting means for moving said accumulator piston against said second spring means after said servo-piston moves against said first spring means when oil pressure is applied to said apply side oil chamber via one of said ports.

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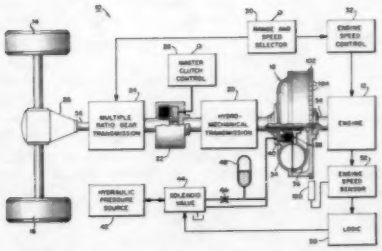
**4,388,987**

## HYDROMECHANICAL TRANSMISSION EMPLOYING LOCKUP CLUTCH

**Richard G. Hennessey, Oak Lawn; Richard B. Beemer, Lombard, and Harold W. Melles, Downers Grove, all of Ill., assignors to International Harvester Co., Chicago, Ill.**

**Filed Mar. 3, 1981, Ser. No. 240,040**
**Int. Cl.³ F16D *25/10***
**U.S. Cl. 192—3.26** **14 Claims**




1. A rotary power transmission for transmitting to an output shaft rotary power applied to an input shaft from a source of rotary power, said system comprising:
a fluid coupling having an impeller and an output turbine interposed between said input shaft and said output shaft and operative to transmit power therebetween;
a master clutch interposed between said input shaft and said output shaft, said master clutch being operative to interrupt the flow of power between said input shaft and said output shaft;
means including a lockup clutch operable to a first condition of operation to permit relative motion between said impeller and an output turbine, said lockup clutch being operative to a second condition of operation to prevent relative motion between said impeller and said output turbine; and
means including an electronic circuit for altering the condition of operation of said lockup clutch, said altering means responsive to the master clutch being operative to interrupt said power flow, and said altering means also being responsive to the rotary speed of said rotary power source for operating said lockup clutch from said first condition of operation to said second condition of operation when the speed of said rotary power source exceeds a first predetermined level, and vice versa when the master clutch is operative to interrupt said power flow.

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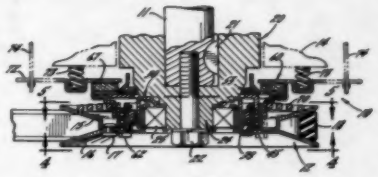
**4,388,988**

## ANTI-KICKBACK CLUTCH-BRAKE UNIT

**J. G. Fraser MacDonald, Detroit, Mich., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.**

**Filed May 11, 1981, Ser. No. 262,139**
**Int. Cl.³ F16D *67/02***
**U.S. Cl. 192—12 BA** **4 Claims**



1. A clutch-brake unit comprising input and output members supported to rotate about a common axis, an annular friction shoe movable axially relative to said input and output members, resilient means biasing said shoe axially into frictional engagement with said input member and yielding to permit said shoe to move axially out of frictional engagement with said input member, said shoe rotating with said input member when said shoe is in frictional engagement with said input member, means causing said output member to turn with said input member when said shoe is in frictional engagement with and is turned by said input member, a brake ring movable axially relative to said input and output members between clutch-engaged and clutch-disengaged positions and biased to said clutch-engaged position, said brake ring being rotatable relative to said input member and serving to hold said friction shoe out of frictional engagement with said input member when said ring is in said clutch-disengaged position, means connecting said brake ring to said output member and causing said brake ring to rotate in unison with said output member when said ring is in said clutch-disengaged position, and means frictionally coupling said brake ring to said friction shoe and causing said friction shoe to rotate with said brake ring when the latter is turned while in said clutch-disengaged position.

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**4,388,989**

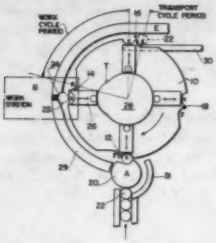
## CONTINUOUS ROTARY METHOD OF TRANSPORTING ARTICLES

**George W. Edmunds, Derwood, Md.; George S. McVeigh, Springfield, and Werner H. Schmitt, Falls Church, both of Va., assignors to Hoppmann Corporation, Chantilly, Va.**

**Filed Jul. 23, 1981, Ser. No. 286,113**
**Int. Cl.³ B65G *47/00***
**U.S. Cl. 198—339** **6 Claims**

1. Continuous rotary method of transporting articles with respect to a stationary work station comprising:
(A) moving an article into engagement with a pocket defined within the periphery of a rotating disc;
(B) transporting said article within a rotary arc, defined by said rotating disc;
(C) sequentially pushing said article radially outwardly from said pocket within rotating disc and into a stationary work station;

(D) pushing said article radially inwardly and re-engaging said article within the periphery of said rotating disc, such that said article may roll along the periphery of the disc until it reaches the next pocket; and



(E) tangentially disengaging said article from the periphery of said rotating disc.

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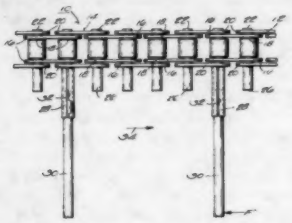
4,388,990

## ARTICLE CARRYING ATTACHMENT FOR CONVEYOR CHAIN

Anthony J. Michalik, Springfield, Mass., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Apr. 6, 1977, Ser. No. 785,260
Int. Cl.[3] B65G 17/12, 17/32
U.S. Cl. 198—645 4 Claims



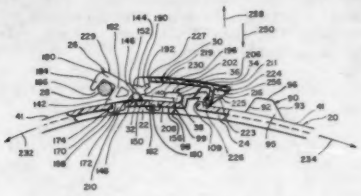
1. In a conveyor chain of the type having extended link connecting pins to which articles to be conveyed are attached an improved conveying attachment assembly comprising, cylindrical chain link connecting pins extending a short distance outwardly of the chain links, hollow cylindrical bushings for at least some of said connecting pins having lengths exceeding the lengths of the extended portions of said connecting pins, said bushings each being split longitudinally along its full length and having a bore sized to fit over the extended portion of one of said connecting pins and to be held thereon by frictional engagement, and conveying pins each having an end portion sized to fit within the bore of one of said bushings opposite the connecting pin and to be held therein by friction engagement, such that said bushing will open to release said conveying pin without damaging said conveying pin or said connecting pin, under a force imposed against the conveying pin in a direction transverse to the axis of said conveying pin should it encounter an obstruction.

4,388,991

## SEALING AND STORAGE RING WITH LATCH APPARATUS

Macy J. Price, 26112 Genesee Dr., Golden, Colo. 80401

Filed Jul. 9, 1981, Ser. No. 281,588
Int. Cl.[3] B65D 85/67; B65H 75/00; G11B 23/02; A47F 7/00
U.S. Cl. 206—53 10 Claims



1. Apparatus for supporting a reel device comprising:

band means, having a pair of opposite end portions with abuttable end surfaces, for mounting in a reel supporting position on the periphery of the reel device in circumjacent abutting supporting engagement therewith;

engageable and disengageable latch means and keeper means, located on said end portions of said band means and being operable between a closed latched position, whereat said abuttable end surfaces are fixedly releasably held in abutting engagement with one another and said band means is fixedly releasably held in said reel supporting position, and an open unlatched position whereat said band means is removable from the reel device;

latch mounting means attached to one of said end portions in juxtaposition to the end surface thereof for pivotally supporting said latch means for movement relative to said keeper means between said closed latched position and said open unlatched position;

said keeper means being fixedly attached to the other one of said end portions in juxtaposition to the end surface thereof for releasable engagement with said latch means; and

a single pivotal connecting means for pivotally connecting said latch means to said mounting means and providing only one pivotal axis therebetween, said single pivotal connecting means comprising: only a rigid shaft means on said latch means and only an elongated slot means on said latch mounting means having a length and width greater than the diameter of said shaft means for enabling a relatively large amount of lateral movement of said shaft means relative to the length of said slot means and a relatively small amount of lateral movement of said shaft means relative to the width of said slot means whereby said pivotal axis is movable relative to said latch mounting means.

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4,388,992

## CONTAINER SUITABLE FOR HOLDING A STACK OF PHOTOGRAPHIC SHEETS

Hugo F. Deconinck, Deurne-Zuid, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Sep. 3, 1981, Ser. No. 299,012
Claims priority, application United Kingdom, Sep. 8, 1980, 8028898
Int. Cl.[3] B65D 85/30; G03B 17/26
U.S. Cl. 206—455 9 Claims

1. A container suitable for holding in generally flat condition a stack of photographic sheets of generally equal size, said container comprising four side walls and a bottom wall for receiving a stack of said sheets, spring means for biasing said stack of sheets away from said bottom wall, stack retaining means for retaining the stack within said side walls against the action of said spring means, said retaining means projecting inwardly from the edges of said side walls over and in contact

with only the side margins of said sheets, leaving the remainder of the sheet area accessible for photographic exposure to a light image, an opposite two of said side walls having matching portions thereof free of said stack retaining means to leave corresponding opposed sections of said sheet margins unretained, whereby the application of buckling forces to said front sheet in its own plane causes that portion of said sheet having the unretained margins to buckle upwardly from the

sheet plane preparatory to removal of the thus-buckled sheet from said stack, and sheet-buckle detent means projecting below the plane of said top sheet a distance at least equal to about the thickness of one of said sheets at points on said two opposite side walls spaced substantially a common distance from a common side wall, whereby said top sheet after having undergone buckling is prevented by abutment of an edge from returning to said original flat condition in the container.

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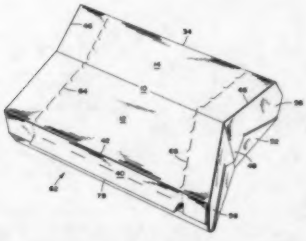
**4,388,993**

## MULTIPLE ACCESS CARTON

**John J. Lavery, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.**

**Filed Jan. 26, 1981, Ser. No. 228,114**
**Int. Cl.³ B65D** *5/10, 5/54*
**U.S. Cl. 206—611** **7 Claims**



1. A multiple access carton comprising:
a. top, bottom and side wall members hingedly connected by fold lines to form a carton body,
b. major and minor panels on each end of said carton for nonadhesively and mechanically detachably interlocking with each other to form an end closure,
c. said panels including:
i. a generally U-shaped major end panel attached to each end of said carton body and having a locking tab integrally formed therewith, said locking tab being located at the bottom of and extending toward the open end of said U, and
ii. a projection forming said minor end panel and hingedly attached to each end of said carton body opposite the major end panel at that end for at least partially overlapping the arms of said U and extending at least partially under said locking tab for interlocking said major and minor end panels thereby forming said end closures, and
d. a tear strip formed in and extending across said top wall and of sufficient width whereby the contents of said carton may be conveniently retrieved through either of said non-adhesively and mechanically detachably interlocked end closures or through said top wall when said tear strip is removed.

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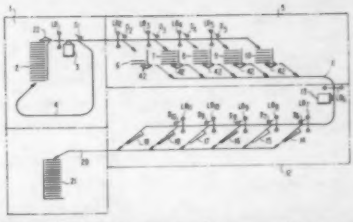
**4,388,994**

## FLAT-ARTICLE SORTING APPARATUS

**Kazuyoshi Suda; Akira Fujimura, and Kiyoshi Tsuda, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 14, 1980, Ser. No. 207,038**
**Claims priority, application Japan, Nov. 14, 1979, 54-147404**
**Int. Cl.³ B07C** *5/38;* **B65H** *39/02*
**U.S. Cl. 209—564** **8 Claims**



1. A flat-article sorting apparatus for rearranging an order of flat articles, each of the flat articles being provided with a sort code thereon, the sort codes corresponding to the order in which the flat articles are to be rearranged, comprising:
means for advancing the flat articles sequentially one by one;
means for scanning the flat articles to read the sort codes thereon as the flat articles are sequentially advanced;
means responsive to the scanned sort codes for determining the order in which the flat articles are to be rearranged;
a plurality of primary sort storages ranked in a first priority to which said flat articles are advanced;
means responsive to said determining means for assigning said flat articles so that a substantially equal number of said flat articles are assigned to each primary sort storage;
means responsive to said assigning means for sorting the flat articles into the respective primary sort storages in such a manner that numbers of the flat articles stored in the respective primary sort storages are substantially equal;
a plurality of secondary sort storages ranked in a second priority;
means for advancing said flat articles from said primary sort storages to said plurality of secondary sort storages;
second means for sorting the flat articles from the primary sort storages into the secondary sort storages according to the order determined by the determining means; and
means for extracting the flat articles from the secondary sort storages and accumulating the flat articles in the order determined by the determining means.

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**4,388,995**

## COLLAPSIBLE CONTAINER

**Min H. Ahn, 5111 Maple Rd., Richmond, British Columbia, Canada**

**Filed Jun. 8, 1981, Ser. No. 271,472**
**Int. Cl.³ B65D** *6/18;* **B65J** *1/02*
**U.S. Cl. 220—7** **10 Claims**

1. A container able to be moved from a raised position to a folded position and comprising:
a base;
a roof spaced apart from the base;
a plurality of first members pivotally attached to the base and extending upwardly when the container is raised;

a plurality of second members pivotally attached at one end to the roof and each pivotally attached at its other end to a first member;

upper side panels each extending between the roof and a pair of second members;

a cam pivotally mounted within each first and second member;

rods extending from each cam towards the roof and base respectively;

locking means attached to each rod and extendable to engage each pivotal joint whereby pivoting of the joint is prevented; and

rotation of the cam retracting the locking means so that they do not engage the pivotal joint whereby the joints are free to pivot.

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**4,388,996**

**SELF-RIGHTING TRAINING CUP**

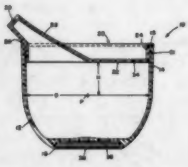
**Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.**

**Continuation-in-part of Ser. No. 106,839, Dec. 26, 1979, Pat. No. 4,303,170. This application Nov. 25, 1981, Ser. No. 324,968**

**The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.**

**Int. Cl.³ A47G *19/22***

**U.S. Cl. 220—70** **7 Claims**



1. A self-righting cup having a lower portion and an upper portion, said lower wall portion having a flat defining the bottom of said cup and a rounded sidewall extending upwardly therefrom, said upper portion having a sidewall which extends upwardly from said rounded sidewall of said lower portion, the ratio of the outer diameter of said cup at the point of intersection of said upper and lower portions to the effective height of said upper portion being at least 3 and the base of said cup having a weighting member the weight of which is effective in relation to said ratio to cause consistent self-righting of said cup when tipped.

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**4,388,997**

**VENT FOR PAINT CUPS**

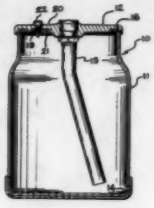
**Thomas E. Grime, Temperance, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio**

**Filed Apr. 20, 1981, Ser. No. 255,358**

**Int. Cl.³ B65D *51/16***

**U.S. Cl. 220—209** **7 Claims**

1. An improved paint cup for a suction feed hand held spray gun comprising a paint jar, a removable cap closing said jar, said cap having interior and exterior surfaces, a vent opening extending through said cap, and a resilient unitary molded check valve means positioned in said vent opening for allowing exterior air to flow into said jar while inhibiting paint flow from said jar through said vent opening, said check valve means comprising a hollow body extending from above said exterior surface through said vent opening to below said interior surface, a peripheral flange extending about said body immediately below said interior surface, end means extending from said body and resiliently engaging said exterior surface for urging said flange against said interior surface to form a fluid seal at said interior surface, and resilient ducks bill ends means extending from said body below said interior surface for allowing air to be drawn into said jar while inhibiting paint flow from said jar through said vent opening.



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**4,388,998**

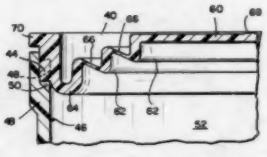
**LID AND CONTAINER WITH IMPROVED FASTENING AND SEALING MEANS**

**J. Larry Underwood, 104 Dixie Dr., Woodstock, Ga. 30188; Stephen M. Thompson, Stone Mountain, and John S. Budde, Atlanta, both of Ga., assignors to J. Larry Underwood, Atlanta, Ga.**

**Filed Sep. 14, 1981, Ser. No. 302,146**

**Int. Cl.³ B65D *39/00***

**U.S. Cl. 220—307** **22 Claims**



9. A lid for a container comprising a substantially longitudinal surface at a periphery of the lid, a series of longitudinally and radially relieved interengaging elements supported by the substantially longitudinal surface for fastening the lid to a container, a central disk constituting a major portion of the lid, and at least one intermediate ring-shaped step having at least one section which is substantially thinner than the remaining portions of the ring-shaped step for imparting flexibility between the central disk and the periphery of the lid.

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**4,388,999**

**DOUBLE-WALLED CARTON AND BLANK FOR FORMING SAME**

**Chapman Berry, Old Lyme, and Robert A. Hackenberg, East Lyme, both of Conn., assignors to Robertson Paper Box Co., Inc., Montville, Conn.**

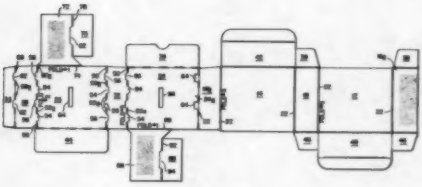
**Filed Nov. 19, 1980, Ser. No. 208,162**

**Int. Cl.³ B65D *5/02, 5/48***

**U.S. Cl. 220—416** **17 Claims**

1. A collapsible carton of the type composed of a series of

generally rectangular hinged-together panels folded spirally to form a double-walled tube having two pairs of opposite inner walls and two pairs of opposite outer walls, the innermost and outermost panels of the series constituting glue flaps adhered to first and second underlying panels respectively to maintain the integrity of the tube, the first underlying panel forming one of said inner walls, the outermost panel forming a part of one of said outer walls, spacers struck from the inner walls of the tube at the three corners thereof remote from said innermost panel for engaging the outer walls of the tube to maintain the spacing between the inner and outer walls at those corners, the improvement comprising at least one tab struck from the innermost panel adjacent its hinge line to the next outer panel in the series, means defining at least one tab-registering opening in the first underlying panel to which the innermost panel is adhered for receiving said at least one tab whereby said tab can engage the panel to which the outermost panel is hinged so as to maintain a space between the innermost panel and the panel to which the outermost panel is hinged, spacer means formed by said first underlying panel and extending from the second underlying panel to said next outer panel so as to maintain a space between said next outer and outermost panels, a divider wall extending between and generally perpendicular to one pair of opposite inner walls of the tube and extending substantially the full length of said one pair of opposite inner walls so as to divide the interior of the carton into two compartments,



each divider wall including first and second divider panels, means for hingedly connecting said divider panels at corresponding first boundaries thereof to different ones of said one pair of oppposite inner walls, said divider panels having their corresponding opposite boundaries terminating adjacent different other ones of said one pair of opposite inner walls, and means for adhering said divider panels to each other.

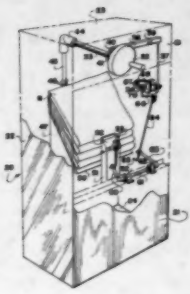
9. A blank for forming a collapsible double-walled carton having spacers between the inner and outer walls at all four corners of the carton comprising a series of at least nine wall panels hinged together along parallel hinge lines, panel means hinged to the upper and lower boundaries respectively of the second and fourth panels from one end of the series, each said panel means including a first panel hinged to one of said upper and lower boundaries along a hinge line perpendicular to the hinge lines between said wall panels and a divider panel hinged to a side boundary of said first panel along a hinge line parallel to the hinge lines between said wall panels, said divider panels having substantially the same width as the first and third wall panels, spacer tabs struck from the wall panels on opposite sides of at least three hinge lines between adjacent wall panels in the series so that, when said adjacent wall panels are oriented perpendicular to one another, orthogonally directed tabs are formed at each of three said hinge lines, a glue flap hinged to one of said wall panels in the series and one or more additional spacer tabs formed at the hinge line connecting said glue flap and said one panel.

**4,389,000**

## NEWSPAPER VENDING MACHINE

**Fred O. Godley, and John A. Laurents, both of Charlotte, N.C., assignors to Single Vend Inc., Charlotte, N.C.**

**Filed Jul. 13, 1981, Ser. No. 283,071**
**Int. Cl.³ G07F *11/60***
**U.S. Cl. 221—8** **7 Claims**



1. In a newspaper vending machine having a vertically movable inclined platform supporting a group of newspapers, a stationary dispensing wedge having an inclined upper surface, a drive shaft operatively connected to the platform, a dispensing chute and means to rotate the shaft to elevate the platform and raise successive newspapers above the dispensing wedge and dispense them by gravity through a dispensing chute, the combination of a clutch between the drive shaft and the means to rotate the shaft and normally disengaging the shaft from the rotating means, means to activate the clutch and engage the shaft with the rotating means to raise the platform and dispense a newspaper.

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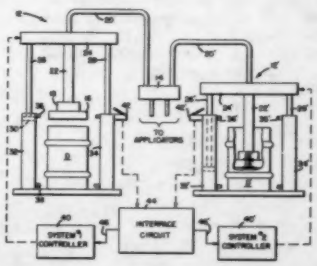
**4,389,001**

## INTERFACE CONTROL CIRCUIT FOR MULTIPLE HOT MELT MATERIAL SUPPLY SYSTEMS

**Jerry C. Franklin, Castroville, Calif., assignor to Lockwood Technical, Inc., Monterey, Calif.**

**Filed May 13, 1981, Ser. No. 263,178**
**Int. Cl.³ B67D *5/62***
**U.S. Cl. 222—63** **4 Claims**




1. Apparatus for switching between a first system for delivering hot melt material and a second system for delivering hot melt material wherein each system includes a pump for pumping hot melt material, a motor for driving the pump, controller means for controllably energizing the motor, and a sensor for sensing when the hot melt material has been depleted, and wherein there is a manifold and means connecting the pump outputs to said manifold for affording delivery of hot melt material to said manifold, said apparatus comprising a first circuit having first means for activating said controller means

of said first system and a second circuit having second means for activating said controller means of said second system, a first locking element having a first energizer in said first circuit in shunt with said first activating means, a first normally open lock-in contact operably coupled to said first energizer and connected in said first circuit in series with said first activating means so that when said first energizer is energized said first activating means is locked in, said first locking element having a first normally closed lock-out contact in said second circuit in series with said second activating means so that when said first energizer is energized said second activating means is locked out, a second locking element having a second energizer in said second circuit in shunt with said second activating means, a second normally open lock-in contact operably coupled to said second energizer and connected in said second circuit in series with said second activating means so that when said second energizer is energized said second activating means is locked in, said second locking element having a second normally closed lock-out contact in said first circuit in series with said first activating means so that when said second energizer is energized said first activating means is locked out, a first normally closed disconnect contact in series in said first circuit and means responsive to the sensor in said first system for opening said first disconnect contact to deactivate said first system when hot melt material has been depleted therefrom, a first normally open transfer contact in shunt with said second lock-in contact of said second locking element and means responsive to the sensor in said first system for closing said first transfer contact in response to hot melt material in said first system being depleted so as to activate said second system, and a second normally closed disconnect contact in series in said second circuit and means responsive to the sensor in said second system for opening said second disconnect contact to deactivate said second system when hot melt material has been expended therefrom, a second normally open transfer contact in shunt with said first lock-in contact of said first locking element, and means responsive to the sensor in said second system for closing said second transfer contact in response to hot melt material in said second system being depleted so as to activate said first system, whereby on hot melt glue being depleted from one of said systems the other of said systems is activated to afford substantially continuous delivery of hot melt material to said manifold.

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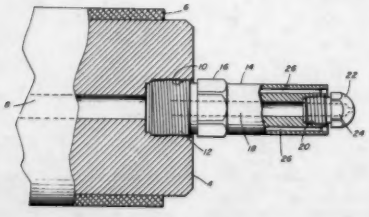
**4,389,002**

## INJECTION MOLDING NOZZLE

**Richard D. Devellian, Rockport, and Paul M. Swenson, Gloucester, both of Mass., assignors to Kona Corporation, Gloucester, Mass.**

**Filed Feb. 7, 1980, Ser. No. 119,304**
**Int. Cl.³ B29F *1/05*; B67D *5/62***
**U.S. Cl. 222—146 HS** **5 Claims**



1. The combination comprising:

(a) an extruder barrel of an injection molding machine having a bore through which molten plastic material is adapted to flow and to be ejected therefrom;

(b) means for heating said extruder barrel and the plastic material therein to a predetermined desired operating temperature at which said plastic material is maintained in its molten state;

(c) an injection nozzle separate and distinct from said extruder barrel and having a first end portion which extends for a substantial distance within and is in good thermal contact with said barrel, said nozzle having a central elongated bore, separate and distinct from the bore of said extruder barrel and adapted to receive said molten plastic material after it has been ejected from the bore of said extruder barrel and to discharge it into a mold; and

(d) a plurality of heat pipes in the body of said nozzle, distributed around said central bore, one end of each of said heat pipes extending for a substantial distance within said first end portion of said injection nozzle, the rest of each of said heat pipe continuing substantially along the entire length of said central bore;

(e) each of said heat pipes being free of any heat input except from said extruder barrel and the molten plastic material in said nozzle.

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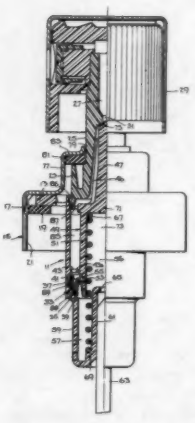
**4,389,003**

## SLIDING INLET SEAL FOR AN ATOMIZING PUMP DISPENSER

**Philip Meshberg, 2500 South Ocean Blvd., Palm Beach, Fla. 33480**

**Continuation of Ser. No. 7,943, Jan. 31, 1979, abandoned. This application Feb. 26, 1981, Ser. No. 238,368**
**Int. Cl.³ B05B *11/00***
**U.S. Cl. 222—321** **8 Claims**



1. A dispensing pump comprising: a pump body within which there is formed, by a sidewall portion, a pump chamber having an inlet defined by a flexible annular seal made of plastic installed at the inner end of said pump chamber and abutting against said sidewall portion and forming a throat; a dispensing stem operatively coupled to said piston; a valve member, of a material of a hardness different from said seal, cooperating with and guided by said throat and operatively coupled to said piston such that when said piston is in an at rest, unoperated position, communication is established between the pump chamber and the area below said throat, and when said piston is depressed, said valve member cooperates with said annular seal in said pump chamber to prevent such communication; and means biasing said valve member, piston and stem to an unoperated, at rest position; the annular seal in said pump chamber being mounted for sliding motion therein along said sidewall portion between a first inward position where it seals against said pump body and a second outward position where it establishes a path of communication from below said throat into said chamber, a gap between the inner end of said pump

body and the bottom of said flexible seal and at least one channel bridging the remainder of said seal; an annular projection formed on the inside of said sidewall of said pump chamber, spaced from the inner end of said chamber a distance greater than the dimension of said annular seal in the same direction limiting the sliding motion of said annular seal; said annular seal comprising a vertical portion of an outer diameter at least slightly less than the inner diameter of said pump chamber, a second portion extending inwardly and downwardly therefrom and a third sealing portion extending upwardly and inwardly from said inwardly and downwardly extending portion and forming a sealing edge contacting said valve member, the inner end of said pump chamber extending downwardly at the same angle as said inwardly and downwardly extending portion whereby during pump operation a seal will be made between said inwardly and downwardly extending portion and said inner end of said pump chamber.

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**4,389,004**

## SELF-CLOSING TILTING VALVE

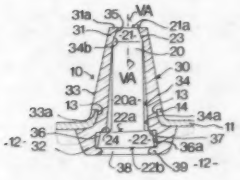
**Luigi D. Bon, Feldstrasse 141, 4663 Aarburg, Switzerland**

**Filed Jul. 17, 1981, Ser. No. 284,221**

**Claims priority, application Switzerland, Aug. 5, 1980, 5911/80**

**Int. Cl.³ B65D *83/14***

**U.S. Cl. 222—402.22** **12 Claims**




1. Self-closing tilting valve sealingly insertable in a lid for a container fillable with product under excess pressure and provided with a valve mounting, which valve comprises

an essentially rigid mandrel member having a base part and a tip part,

an enveloping nozzle member surrounding said mandrel member and having an axial product passage surrounded by an inner wall and receiving said mandrel member therein, a head part with an outlet opening for said axial passageway, a foot part having a bottom opening for said axial passageway, and an intermediate portion extending axially between said head part and said foot part,

said foot part of said nozzle member having a cavity therein opening at the underside of said foot part, said base part of said mandrel member being lodged in said cavity, and extending therein transversely to the central longitudinal axis of said mandrel member,

said passageway being obturated, in closed valve position, by sealing contact between an obturating surface of said inner wall in said cavity and a correspondingly located counterface on said base part of said mandrel member, and being further obturated by said head part of said nozzle member surrounding said tip part of said mandrel member snugly laterally when said valve is in closed position,

an upper portion of said foot part of said nozzle member up to its merging zone with said intermediate portion being insertable in the said valve mounting,

said tip part of said mandrel member and said head part of said nozzle member remaining in contact with one another in the closed as well as in any discharge position,

a radially inwardly projecting annular flange of said foot part on the underside of the latter which flange engages with upward bias the underside of the base part of said mandrel member, and urges said obturating face and said counterface into sealing engagement with one another,

which valve is characterized by the following inventive combination of features:

(a) said annular flange consists of an elastically flexible material which is deformable downwardly in axial as well as radial direction in respect of the longitudinal central axis of said mandrel member, while the upper portion of said foot part and the intermediate portion of said nozzle member are substantially rigid, and

(b) space for radial play being provided about the lateral peripheral wall of said mandrel member base part, permitting radial displacement of said base part within said cavity during tilting of the intermediate portion and the head part of said nozzle member, and corresponding tilting of said mandrel member,

said space for radial play constituting part of said passageway and being obturated in closed position by said annular flange, while being opened, by tilting pressure being applied to the portion of said nozzle member above said foot part and simultaneously to said mandrel member.

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**4,389,005**

## INFANT CARRIER

**Richard B. Cable, and Willie D. Cable, both of 3063 Waterdale Dr., Loveland, Colo. 80537**

**Filed May 4, 1981, Ser. No. 260,064**

**Int. Cl.³ A47D *13/02***

**U.S. Cl. 224—159** **14 Claims**

1. An infant carrier, comprising:

(a) a firm saddle for supporting an infant;

(b) a hip rest connected to one end of the saddle and having force disbursion means therein for spreading forces applied through the saddle over a broader area than the connection between the saddle and hip rest;

(c) shoulder support means for suspending the carrier from the body of a wearer; and

(d) first strap means connecting the shoulder support means to said hip rest;

(e) wherein said saddle comprises a stiff support member having a narrow end and a wide end, the narrow end being attached to said hip rest and said wide end being opposite therefrom.

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**4,389,006**

## STRUCTURE FOR SECURING A BAND TO A WATCHCASE

**Hiromichi Nagata, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Oct. 5, 1981, Ser. No. 308,832**

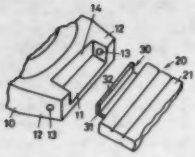
**Claims priority, application Japan, Oct. 7, 1980, 55-142282[U]**

**Int. Cl.³ A44C *5/14***

**U.S. Cl. 224—164** **5 Claims**

1. A structure for securing a band to a watch case having a pair of legs and a cover between the legs at a band-connected side, comprising a connecting member secured to an end por-

tion of said band, said connecting member comprising a horizontal plate extending from the end of said band and a vertical plate downwardly extending from the extended end of said horizontal plate, threaded holes provided in said legs, a screw



engaged in each of said threaded holes, said screw having a taper end portion which is engaged with said connecting member, whereby said connecting member is pressed against the side wall of said watch case.

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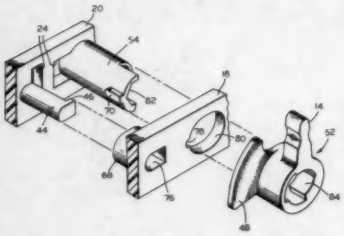
4,389,007

## MANUALLY ASSEMBLABLE AND DISASSEMBLABLE SHEET-FEED TRACTOR EMPLOYING IMPROVED CLAMP ASSEMBLY

Karl G. Seitz, Goshen, Conn., assignor to Data Motion Incorporated, Torrington, Conn.

Filed Sep. 23, 1981, Ser. No. 304,858
Int. Cl.[3] B65H *17/38*
U.S. Cl. 226—74 5 Claims



1. A sheet-feed tractor adapted to be slidably mounted on spaced apart and substantially parallel extending elongated support and drive shafts comprising:

a. a first frame member having a support-shaft opening therein;

b. a second member assembled on said first frame member to form a tractor frame therewith;

c. a drive sprocket mounted on said tractor frame for rotation about the axis of said drive sprocket and having an aperture therethrough adapted to receive the drive shaft for sliding therealong and for driving thereby upon rotation of the drive shaft about its longitudinal axis;

d. an endless belt disposed about said tractor frame in engagement with said drive sprocket to be driven thereby upon driving movement of said sprocket by the drive shaft, said drive belt including sheet engagement teeth adapted to engage in the perforations of sheet material perforated against the side margins thereof for advancement thereof upon driving of said belt by said sprocket;

e. clamp means, having an aperture therethrough adapted to receive the support shaft therein, for clamping the support shaft received therein, said clamp means including a first clamp part on said second frame member and extending through said support-shaft opening in said first frame member to the side of said first frame member opposite that on which said second frame member is disposed, said first clamp part having a generally cylindrical outer surface, said clamp means also including a second clamp part disengageably mounted on said first clamp part and moveable relative thereto to clamp a support shaft received in said aperture in said clamp means, said second clamp part including a ring portion receiving the generally cylindrical exterior surface of said first clamp part therewithin, one of the interior surface of said ring portion and said generally cylindrical exterior surface of said first clamp part providing a radially extending tab and the other providing an engagement surface and an axial slot, said engagement surface engaging said tab throughout a first range of rotational positions of said second clamp part to cause said ring portion to bear against said side of said first frame member opposite that on which said second frame member is disposed to retain said first and second frame members in assembly and prevent axial removal of said second clamp part from said first clamp part, said slot being aligned with said tab in at least one second rotational position of said second clamp part to permit axial removal of said second clamp part from said first clamp part, said second clamp part also including an extension portion extending from said ring portion to provide a second engagement surface spaced from said first-mentioned engagement surface in a direction generally perpendicular to the axis of said support-shaft opening;

and

f. a post on said second frame member, said first frame member having a post aperture spaced from said support-shaft opening, said post extending from said second frame member through said post aperture in said first frame member to provide a second tab on the side of said first frame member opposite that on which said second frame member is disposed, said second tab engaging said second engagement surface throughout said first range of rotational positions of said second clamp part to cause said extension portion to bear against said side of said first frame member opposite that on which said second frame member is disposed to retain said first and second frame members in assembly and prevent axial removal of said second clamp part from said first clamp part, said second engagement surface clearing said second tab in said second rotational position of said second clamp part to permit axial removal of said second clamp part from said first clamp part, said frame members being held in assembly by said clamp parts, removal of said second clamp part from said first clamp part permitting ready disassembly of said frame members from each other.

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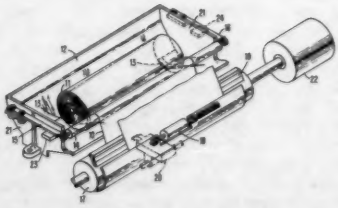
4,389,008

## WEB SUPPLY ROLL JOGGER

Robert E. Boyanowski, Montrose, Pa.; Floyd A. Gregory, Binghamton, and Stanley E. Nemier, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,512
Int. Cl.[3] B65H *17/26, 23/16, 27/00*
U.S. Cl. 226—123 9 Claims



1. Apparatus for feeding a web from a supply roll comprising:

cradle means for holding said supply roll;

feeding means operable for gripping said web to incrementally pull said web from said roll;

a dancer bar arranged transversely of said web between said roll and said feeding means about which said web is pulled; and

resilient support means for each end of said bar for permitting deflection of said bar when said web is pulled, each said support means having a rate of deflection versus load different than the other support means during at least part of the deflection of said bar whereby said bar deflects in response to the tension of said web and said roll is momentarily skewed in said cradle means when said feeding means is operated.

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**4,389,009**

## HIGH SPEED TAPE FEEDER

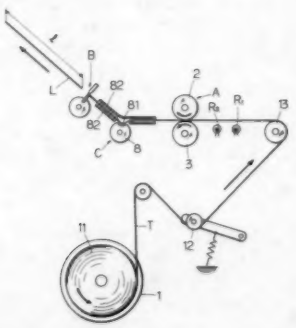
**Kyoichi Yamashita, 2361 Nippa-cho, Kohoku-ku, Yokohama-shi, Kanagawa 223, Japan**

**Filed May 29, 1981, Ser. No. 268,567**

**Claims priority, application Japan, May 30, 1980, 55-71441**

**Int. Cl.³ B65H *17/22***

**U.S. Cl. 226—188** **4 Claims**




1. In a high speed tape feeding apparatus comprising a pair of cylindrical drums rotatable in tangential contact so as to pull a tape out of the roll of tape by frictionally driving the tape therebetween, said tape having a series of identical patterns and check marks printed thereon to be cut into sections, each bearing one printed pattern, the improvement comprising:

one of said pair of drums being mounted for free rotation on a first drive shaft and having a circumference slightly greater than the length of one section to be cut from the tape;

the other drum being mounted for free rotation on a second drive shaft and having a circumference slightly smaller than the length of one section to be cut from the tape;

an electromagnetic clutch between said one drum and the first drive shaft;

a unidirectional clutch between said other drum and the second drive shaft;

photoelectric means for detecting two successive check marks on the tape producing signals; and

means for bringing said electromagnetic clutch into and out of transmission engagement under the control of the photoelectric means.

**4,389,010**

## MAGNETIC TAPE GUIDE MEANS

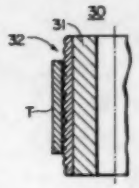
**Kengo Oishi; Masayoshi Moriwaki; Osamu Suzuki, and Kouji Kamiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 10, 1981, Ser. No. 242,210**

**Claims priority, application Japan, Mar. 10, 1980, 55-30021**

**Int. Cl.³ B65H *23/04*; G03B *1/48***

**U.S. Cl. 226—196** **6 Claims**




1. A magnetic tape guide means of cylindrical configuration having formed on the peripheral surface thereof for contact with a moving tape substantially hemispherical projections having diameters or major axis of from 0.5 to 5 μm and a distribution density of from 10,000 to 100,000 projections per square millimeter.

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**4,389,011**

## STITCHING MACHINE

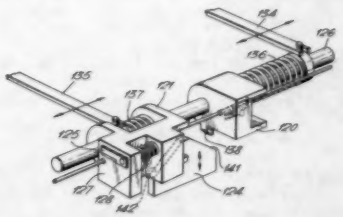
**Michael J. Lovibond, Kimpton, England, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 21, 1979, Ser. No. 106,198**

**Claims priority, application United Kingdom, Dec. 29, 1978, 50325/78**

**Int. Cl.³ B27F *7/21, 7/23***

**U.S. Cl. 227—5** **12 Claims**



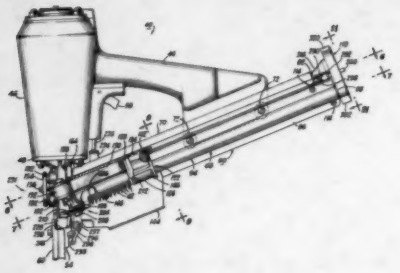

1. A wire stitcher having a movable cutter for cutting a length of wire from a supply thereof and stitcher head for forming and driving the length of cut wire for binding a set of sheets, the improvement including gripper means adapted to present the wire to the stitching head and to advance the wire by a distance dependent upon the thickness of the set, means for positioning the cutter in accordance with the thickness of the set, said movement of said gripper means and said cutter being limited by inhibitor means positioned in accordance with the set thickness, means for biasing said gripper means and said cutter towards each other, and a common drive member for driving said gripper means and said cutter.

4,389,012

## FASTENER TOOL LOADING ASSEMBLY

Raimonds Grikis, Morton Grove; Bernard W. Geist, Melrose Park, and Edmund Frank, Chicago, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Apr. 22, 1981, Ser. No. 256,491
Int. Cl.³ B25C 3/00, 1/04
U.S. Cl. 227—120 6 Claims



1. A loading assembly for loading uncollated fasteners from an elongated chute holding a supply of fasteners into the end of an elongated magazine of a fastener driving tool, said assembly comprising:

a feed coupling adapted to be supported on an end of the magazine and defining a loading opening;

an exit coupling adapted to be supported on an end of the chute and defining an exit opening;

feed and exit stop members movably supported respectively on the feed and exit couplings;

means resiliently biasing said stop members to block the corresponding loading and exit openings;

said feed and exit couplings being relatively movable toward one another in the longitudinal direction to a mated position wherein said loading and exit openings are aligned;

abutments defined on the feed and exit couplings engagable respectively with the exit and feed stops in said mated position for moving said stops clear of the corresponding openings;

a projection extending longitudinally from said exit coupling and defining a ramp structure; and

said feed coupling including guide structure received upon said ramp structure for guided and supported sliding movement of said feed coupling into said mated position.

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4,389,013

## CONTAINER HAVING A SELF-LOCKING LID

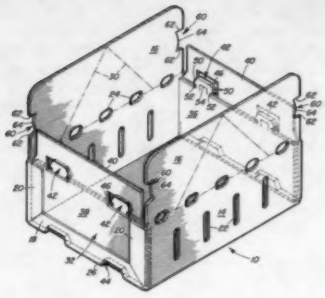
Richard A. Hall, Danville, and James R. Sorensen, San Bruno, both of Calif., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Aug. 26, 1981, Ser. No. 296,531
Int. Cl.³ B65D 45/00, 5/66
U.S. Cl. 229—45 R 5 Claims

1. A container suitable for produce and the like having a body defining the container opening and a lid to close such opening with a multipoint friction lock for retaining the lid closed on the container body, said lock comprising:

a stacking tab projecting from the perimeter of said body opening having at least one undercut side edge forming a recess at such edge adjacent the base of said tab, and said tab further having an aperture formed on the face of said tab facing toward said opening; and

a locking notch formed on an edge of said lid located therealong for said stacking tab to engage therein when said lid is closed on said container body, said notch having at least one end thereof disposed relative to said undercut side edge of said stacking tab so as to engage in said recess of said stacking tab when said lid is closed, and said notch further having a locking portion protruding into said notch intermediate the notch ends to engage in said stacking tab aperture in the closed position of said lid, said lid is constructed of semi-rigid material and scored generally



transversely to facilitate bending said lid for disengagement of said locking portion in said aperture when said lid is bent and engagement of said locking portion in said aperture when said lid is unbent.

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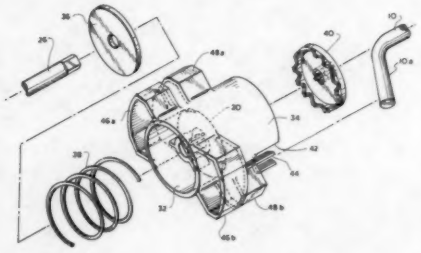
4,389,014

## VENT DAMPER WITH EMERGENCY MANUAL OVERRIDE

Ho Chow, River Edge, N.J., assignor to Melnor Industries, Inc., Moonachie, N.J.

Filed Apr. 16, 1981, Ser. No. 254,774
Int. Cl.³ F23N 3/00; F16K 35/00
U.S. Cl. 236—1 G 32 Claims



1. A device for controlling the flow of fluid through a conduit comprising drive means, a movable damper plate situated in the conduit, clutch means for drivingly interconnecting said plate and said drive means, means for controlling said drive means in response to the position of said plate, and means for locking said plate in a given position, said clutch means comprising a slip clutch adapted to slip when said locking means is actuated to prevent movement of said plate from said given position.

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4,389,015

## CORRUGATION-FREE RAIL

Hans Guntermann; Gerhard Arndt, both of Essen, and Gustav Baum, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Elektro-Thermit GmbH, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,640
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927890
Int. Cl.³ B22D 19/00
U.S. Cl. 238—150 2 Claims

1. A corrugation-free rail for track-bound vehicles which

comprises, at least in part of the area adapted to be contacted by a wheel, a metallic material having a martensitic structure, a hardness of 40 to 60 Rockwell C, and the following composition, by weight:

| | |
|---|---|
| carbon | 0.2 to 0.4% |
| chromium | 13 to 18% |
| molybdenum | 0.3 to 1.5% |
| manganese | 0.5 to 1.5% |
| silicon | 0.3 to 1% |
| remainder is iron. | |

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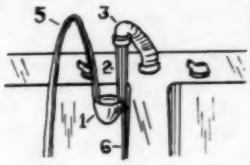
**4,389,016**

## PARABOLOIDAL DRINKING FOUNTAIN ATTACHMENT

**James T. Gibbs, P.O. Box 131-C, R.D. 3, Great Barrington, Mass. 01230**

**Filed Apr. 30, 1981, Ser. No. 258,960**
**Int. Cl.³ E03B *9/20***
**U.S. Cl. 239—24** **7 Claims**




1. A drinking fountain attachment for use with water outlets comprising:

a cup having a substantially paraboloidally shaped inner surface for engaging water directed vertically downward and redirecting it into an upward mode in any direction throughout the 360 degrees of its perimeter, all of the sides of said cup slanting and converging inwardly and symmetrically toward the center point of the cup's bottom; and

means for attaching the cup to a sink directly so that a water source can be directed into the cup any point on its perimeter.

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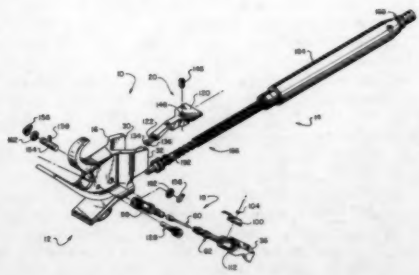
**4,389,017**

## SPRAY GUN

**John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446**

**Filed Apr. 15, 1981, Ser. No. 254,376**
**Int. Cl.³ B05B *1/32***
**U.S. Cl. 239—455** **10 Claims**



1. A spray gun adapted for hydraulically atomizing and spraying liquids having attached thereto conduit means communicating with a source of liquid under pressure, said spray gun including:

(a) a handle portion;

(b) a spray head portion connected to said handle portion;

(c) a fluid bore in said spray head portion communicating with said source of pressurized liquid via said conduit means and terminating in a spray opening in said spray head;

(d) a valve bore in said spray head portion intersecting said fluid bore adjacent said spray opening;

(e) a retractable valve stem in said valve bore which, upon retraction, unobstructs said spray opening and the amount of such retraction defining the extent of the opening of said spray opening;

(f) means biasing said retractable valve stem to obstruct said spray opening; and

(g) trigger means for retracting said valve stem against the biasing action of said biasing means to thereby unobstruct said spray opening to permit spraying of said liquid and selectively defining the extent of valve stem retraction.

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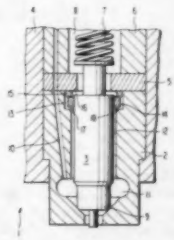
**4,389,018**

## FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

**Frank Thoma; Karlheinz Hoffmann, and Günter Seiler, all of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Mar. 12, 1981, Ser. No. 243,000**
**Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009461**
**Int. Cl.³ F02M *61/16***
**U.S. Cl. 239—533.3** **21 Claims**



1. A fuel injection nozzle for an internal combustion engine, the fuel injection nozzle including a nozzle body means, an injection orifice means provided in the nozzle body means, a nozzle needle means displaceably guided in the nozzle body means for controlling the injection orifice means, an annular chamber means provided in the nozzle body means on a side of the nozzle needle means opposite the injection orifice means, and a stop means provided in the annular chamber means for limiting a displacement of the nozzle needle means, characterized in that an elastic sealing means is guided on the nozzle needle means and is arranged in the annular chamber means at a distance from the wall thereof for admitting fluid pressure to press the elastic sealing means against the nozzle needle means to effect radial and axial sealing, and means is provided for supporting the elastic sealing means against the surface of the stop means.

4,389,019

## METHOD OF AND APPARATUS FOR THE DRY SEPARATION OF PYRITE FROM COAL

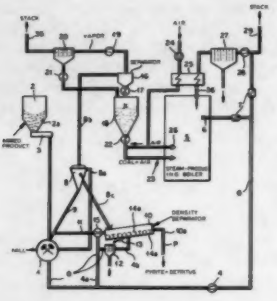
Fritz Adrian, Ratingen; Heinrich Sättler, Treis, and Werner Sauerland, Voerde, all of Fed. Rep. of Germany, assignors to Steag Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,379

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943556

Int. Cl.³ B02C *21/00*

U.S. Cl. 241—19 5 Claims



1. A dry method of separating pyrite from mineral coal comprising the steps of:

(a) milling and drying in a gas stream mined mineral coal product containing coal, pyrite and mineral detritus to produce a fine component consisting predominantly of coal and a gravel component comprising pyrite, mineral detritus and coal;

(b) classifying the milled product of step (a) to separate said components from each other and recycling a portion of said gravel component to step (a); and

(c) withdrawing simultaneously the remainder of the gravel component from step (b) and subjecting same to a density separation to produce a light product consisting predominantly of coal and a heavy product consisting predominantly of pyrite and mineral detritus whereby the pyrite is separated from the coal.

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4,389,020

## ROTARY SCREENS

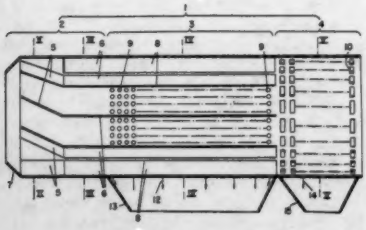
Francois H. Clin; Jean-Noel Gony, both of Orleans, and Francois O. Proust, Olivet, all of France, assignors to Bureau de Recherches Geologique et Minieres, Paris, France

Continuation of Ser. No. 48,577, Jun. 15, 1979, abandoned, which is a division of Ser. No. 865,663, Dec. 29, 1977, Pat. No. 4,176,799. This application Nov. 17, 1980, Ser. No. 207,505

Claims priority, application France, Jan. 6, 1977, 77 00262

Int. Cl.³ B02G *23/00*

U.S. Cl. 241—24 3 Claims



1. A process for salvaging material by means of a rotary screen rotating about a longitudinal axis, utilizing differential crushing and grading of mixed materials, said screen being provided with longitudinal vanes, comprising the steps of; cleaning and distributing the mixed materials; separating by differential crushing and grading of said mixed materials; orienting at least some articles of elongated shape among the mixture to introduce themselves in alignment with and between the longitudinal vanes; separating articles without crushing, by having articles of elongated shaped follow a longitudinal path and the screening residue follow a path substantially perpendicular to said longitudinal path; and providing a filling rate coefficient such that the depth of the products in a bottom longitudinally extending portion of the screen is always less than the width of a vane.

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4,389,021

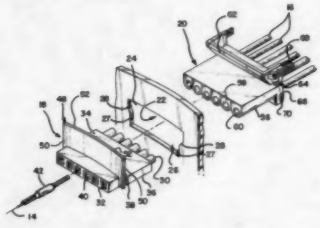
## PANEL MOUNTED CONNECTOR FOR USE IN CONFINED AREAS

Daniel R. Coldren, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,520

Int. Cl.³ H01R *13/447*

U.S. Cl. 339—126 R 6 Claims



1. An electrical connector mounted in a panel member, said connector being of the type comprising an insulating housing of firm plastic material having a mating face and a wire entry face, said housing having external walls extending between said faces and having at least one contact terminal therein, a wire extending into said wire entry face and connected to said terminal, said connector and panel being characterized in that:

said panel has an opening therein, said opening having a connector retaining portion and a connector assembly portion,

said connector retaining portion having an outline which conforms to the outline of a selected transverse cross-section of said housing, said retaining portion having opposed edge portions which are spaced apart by a distance which is substantially equal to, or less than, the distance between the two oppositely directed external wall portions of said selected cross-section of said housing which correspond to said opposed edge portions,

said housing having slot means in said oppositely directed external wall portions, said slot means having a width sufficient snugly to receive opposed edge portions of said connector retaining portion of said opening,

said housing being positioned in said connector retaining portion of said opening with said opposed edge portions extending into said slot means,

said connector assembly portion of said opening being dimensioned freely to admit said housing therethrough, said housing having been assembled to said panel by passing said housing through said connector assembly portion and thereafter moving said housing laterally of its axis into said connector retaining portion, and

a closure flap integral with, and extending substantially normally from, the external wall portion of said housing which is between said oppositely directed external wall

portions, said closure flap conforming to, and being in covering relationship to, said connector assembly portion of said opening.

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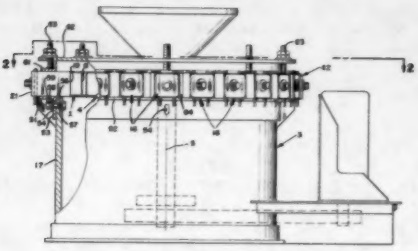
4,389,022

## ROCK CRUSHER BREAKER BLOCKS AND ADJUSTMENT APPARATUS

John H. Burk, 712 Charlton Dr., Pleasant Hill, Calif. 94523

Filed Jun. 4, 1981, Ser. No. 270,336
Int. Cl.³ B02C 13/09
U.S. Cl. 241—275 6 Claims



1. In a rock crusher having a housing (17) and an impeller (4) mounted on a vertical axis (5) the improvement comprising:

a. a plurality of breaker blocks (1) surrounding said impeller and each breaker block having a longitudinal axis (12), an impact portion (6) with a distal end (7) forming an impact face (8), a proximal portion (9) and side walls (23); said impact portion has a transverse across section which is symmetrical to said longitudinal axis and which forms an equal sided polygon and which has a constant cross sectional area throughout its length and attachment means (11) formed in said proximal portion;

b. a plurality of cell members (16) connected to said housing forming a chamber (18) open at its distal end (19) to the interior of said crusher and the proximal end (21) is open to the exterior of said housing;

c. each of said cell members having walls (22) slidably registering with said side walls (23) of said breaker blocks; and

d. an adjustment means releasably connected to said attachment means (11) in said proximal portion.

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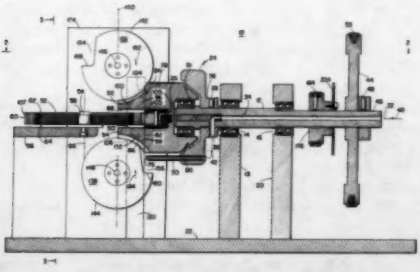
4,389,023

## FLYER WINDER FOR EXTERNALLY SLOTTED DYNAMOELECTRIC MACHINE CORE MEMBER

Robert J. Eminger, Fort Wayne, Ind., assignor to Windamatic Systems, Inc., Fort Wayne, Ind.

Filed May 20, 1981, Ser. No. 265,657
Int. Cl.³ H02K 15/09
U.S. Cl. 242—7.05 B 21 Claims



14. In apparatus for winding a coil in two spaced slots which extend inwardly from the peripheral surface of a magnetic core member and which define a core porton there between around which the coil is wound, the slots communicating with spaced, parallel sides of the core member which are joined by the peripheral surface, the apparatus including a flyer rotatable about an axis and having wire dispensing means eccentric with respect to said axis, the diameter of the path of rotation of said dispensing means being greater than the spacing between the two slots, and means for supporting the core with the peripheral surface thereof in facing relationship with said path of rotation of the dispensing means, means for guiding the wire as it is being dispensed into the two slots and toward the back sides thereof comprising: a pair of elongated shroud members disposed within said path of rotation of the dispensing means and respectively extending outwardly over the opposite sides of the core portion between the two slots to outer ends, each shroud member having an outer surface which tapers to said outer ends thereof, said dispensing means initially winding wire around said shroud members; and means synchronized with said flyer for pulling wire outwardly over said outer surfaces of said shroud members and over said outer ends thereof whereby the wire is guided to enter the two slots toward the back sides thereof to form a coil wound around the core portion between the two slots.

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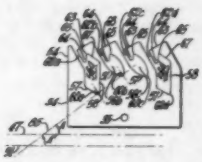
4,389,024

## METHOD AND APPARATUS FOR PACKAGING STRANDS

James E. Sanders, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 10, 1981, Ser. No. 319,942
Int. Cl.³ B65H 54/02, 57/04, 57/16
U.S. Cl. 242—18 G 17 Claims



1. Apparatus for collecting a plurality of strands into a single package comprising:

a rotatable collet adapted to wind said strands thereon;

a traversing means adapted to move the strands along the length of said collet, said traversing means having an axis of movement; and

guide means located adjacent said traversing means, said guide means having a plurality of spaced apart strand accommodating notches wherein at least two of the notches are contained in a reference plane that is obliquely oriented with respect to the axis of movement of said traversing means or axis of rotation of said collet to facilitate the maintenance of the individuality of each of the strands being wound into said package.

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4,389,025

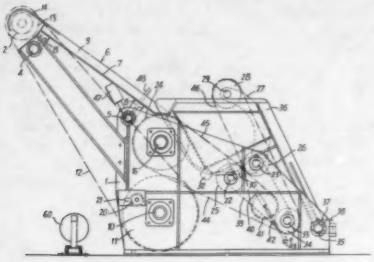
## APPARATUS FOR WINDING WIRE NET WITH SIMPLE TWIST

Pierre Pilboue, Charleville, France, assignor to Trefileries et Cableries Chiers-Chatillon-Gorcy, Levallois-Perret, France

Filed Dec. 15, 1980, Ser. No. 216,656
Claims priority, application France, Dec. 19, 1979, 79 31109
Int. Cl.³ B65H 17/06, 17/20
U.S. Cl. 242—55 5 Claims

1. Apparatus for rolling up wire mesh of simple twist of the type in which each row of mesh is of zig-zag configuration with alternate generally V-shaped equally spaced peaks and

valleys, the peaks of one row are looped through the valleys of an adjacent row to connect the rows together, and adjacent rows of mesh can be folded back alternately toward each other, around lines of articulation formed by the looped-together peaks and valleys of adjacent rows and rolled up to form a compact roll of folded back rows having alternate V-shaped crests and depressions, said apparatus comprising, first and second means for receiving said mesh to form said roll, said means being adapted to receive mesh fed at a predetermined speed from the discharge of a mesh forming machine, each receiving means comprising a first length of a strand and a second length of a strand in opposed relation to said first



length of strand, means mounting said first receiving means with the strands thereof in a first vertical plane in the path of and parallel to the direction of feed of the mesh, means mounting said second receiving means with the strands thereof in a second vertical plane parallel to and in the path of the direction of feed of the mesh and spaced from the first plane by a distance equal to a multiple of the distance between peaks of the rows of mesh, said strands comprising means for supporting the roll by engaging the roll in said V-shaped depressions, and means for driving said strands at a linear speed less than said predetermined speed to roll up said folded back mesh into a roll.

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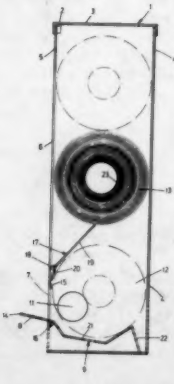
**4,389,026**

## DISPENSING CONTAINER FOR ROLLED PRODUCTS

**Siegfried Willa, Haus Panorama, and Max Zenhäusern, Kehrstrasse 48, both of 3904 Naters, Canton of Valais, Switzerland**

**Filed Feb. 9, 1981, Ser. No. 232,534**
**Claims priority, application Switzerland, Feb. 7, 1980, 993/80**
**Int. Cl.³ B65H** *19/04*
**U.S. Cl. 242—55.3** **6 Claims**



1. A dispensing container for rolls of material, particularly for rolls of toilet tissue, of the type having sidewalls and a vertical front wall including a horizontal opening for withdrawal of said material and removal of empty said rolls, wherein said container includes:

a first horizontal pviot bar disposed adjacent to the lower edge of said opening;

a second horizontal pivot bar disposed adjacent to the upper edge of said opening,

roll-support means pivotable about said first pivot bar from a first normal dispensing position to a second roll-ejection and replacement position, and

lever means pivotable about said second pivot bar from a first normal roll-retaining position to a second substantially vertical roll-release position, wherein said roll support means contacts said lever means in said second position.

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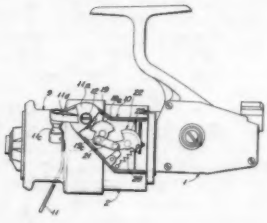
**4,389,027**

## BAIL ARM REVERSING DEVICE FISHING SPINNING REELS

**Kounin Sazaki, and Takehiro Kobayashi, both of Fukuyama, Japan, assignors to Ryobi Limited, Fuchu, Japan**

**Filed Feb. 2, 1982, Ser. No. 344,928**
**Claims priority, application Japan, Feb. 11, 1981, 56-18370[U]**
**Int. Cl.³ A01K** *89/01*
**U.S. Cl. 242—84.2 G** **8 Claims**



1. A bail arm reversing device of an outer spool type spinning reel comprising:

a main body of a reel;

a rotor supported by said main body and provided with a pair of arms formed on a periphery of said rotor at diametrically opposing positions;

a bail arm having opposite ends rotatably supported by said pair of arms, said bail arm being eccentrically mounted with respect to an axis of rotation of said rotor,

a tension spring for selectively biasing said bail arm toward a string take up position and a string pay out position;

a first timing gear having one end pivotally connected to a spoke of said rotor to be movable in a radial direction;

a second timing gear mounted on one of said pair of arms;

a hand operated lever mounted on said one arm and provided with a second kick gear;

a link mechanism interconnecting said bail arm with said hand operated lever, said link mechanism having a dead point which determines the direction of movement of said bail arm;

a pawl mounted on said first timing gear;

a first kick gear having a plurality of teeth and secured to said rotor;

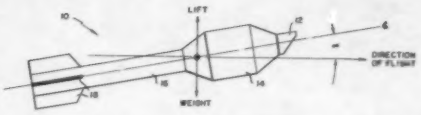
spring means for urging said pawl to engage said teeth of said first kick gear whereby said bail arm snaps to a string pay out position or a string take up position when said link mechanism passes said dead point.

4,389,028

## FLAT TRAJECTORY PROJECTILE

Chris A. Kalivretenos, Hyattsville, and Michael A. Brown, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 649,614
Int. Cl.³ F42B 15/02
U.S. Cl. 244—3.21 25 Claims




1. A projectile capable of flat trajectory flight comprising:
a payload section;
a propulsion unit;
a stabilized, aerodynamic lift-generating section rotatably mounted on the projectile to permit free, uncoupled rotation of the projectile relative to the lift-generating section, said stabilized lift generating section producing a resultant lift vertically oriented to counteract the projectile weight in order to obtain a substantially flat flight trajectory,
said lift-generating section is gyroscopically stabilized in roll by a stabilizing gyroscope, having an inner and outer gimbal, to fixedly orient the resultant lift irrespective of projectile rotation; and
wherein said lift-generating section is fixedly attached to the outer gimbal of said stabilizing gyroscope.

14. A flight control mechanism for a self-propelled, unguided projectile comprising:
an aerodynamic lift-producing device rotatably coupled to the projectile to permit free rotation relative to the projectile,
a gyroscope stabilizing means, having an inner and outer gimbal, fixedly attached to said lift producing device to roll stabilize said device,
said lift-producing device being fixedly attached to the outer gimbal of said gyroscopic stabilizing means; and
whereby the aerodynamic lift produced by said device counteracts the projectile weight in order to obtain a substantially flat flight trajectory.

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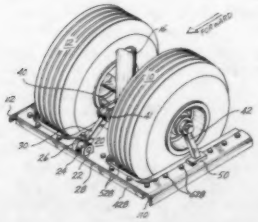
4,389,029

## NOSE WHEEL WATER SPRAY DEFLECTOR

Rudi K. H. Glasenapp, Bellevue, and Andrew J. McCulloch, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 101,939, Dec. 10, 1979, abandoned.
This application Oct. 28, 1981, Ser. No. 315,763
Int. Cl.³ B64C 25/32
U.S. Cl. 244—103 R 2 Claims




1. In combination in an aircraft having a plurality of wing mounted engines and a nose landing gear having a pair of nose wheels, a nose wheel water spray deflector for preventing nose landing gear wheel generated side spray ingestion by said wing mounted engine, said nose wheel water spray deflector having a leading edge extending forward of siad pair of nose wheels, extending across the front of said nose wheels, and further extending in a plane parallel to the runway surface when the aircraft is in a landing configuration with nose wheels on the runway surface, said nose wheel water spray deflector attached to the inner cylinder of said nose landing gear and retractable through the nose wheel doorway during flight of the aircraft, said nose wheel water spray deflector having a lateral support tube connected through a center support member to the tow fitting of said nose gear.

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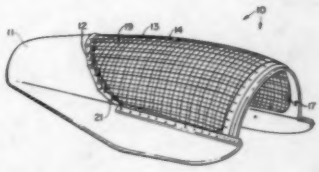
4,389,030

## CANOPY MOSAIC THERMAL BARRIER

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,545
Int. Cl.³ B64C 1/14; B32B 7/00
U.S. Cl. 244—129.3 6 Claims




1. A heat resisting canopy, comprising:
a transparent shell made from an organic material, and defining a convex outer surface and a concave inner surface;
a plurality of transparent elements made from an inorganic material and arranged upon said convex outer surface in the form of a transparent element mosaic outer layer;
a transparent adhesive material joining each of said transparent elements to said transparent shell;
a plurality of metallic ribbons arranged on said transparent shell convex outer surface to form a metallic ribbon lattice, wherein each of said transparent elements is bounded by a portion of said metallic ribbon lattice; and
a plurality of metallic wires arranged over said transparent element mosaic outer layer to form a grid, wherein said grid defines a central intersection on each of said transparent elements, each metallic wire of said plurality of metallic wires having two ends, and each end of each wire being attached to said canopy.

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4,389,031

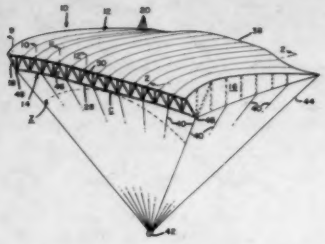
## PARACHUTE

George R. Whittington, P.O. Box 44, East Berlin, Pa. 17316

Filed Aug. 5, 1981, Ser. No. 290,408
Int. Cl.³ B64D 17/02
U.S. Cl. 244—145 9 Claims

1. A ram air parachute having upper and lower skins, a mouth on the forward edge, a trailing edge, side walls, major suspension lines extending from the lower skin to a load and an inner suspension system maintaining separation between the upper and lower skins, the parachute having an airfoil shape in sections from the mouth to the trailing edge, the improvement comprising the lower skin having a U-shaped generally flat section extending along the side walls and mouth and an upwardly extending central recess located within the U-shaped section of the lower skin and including a portion of the trailing edge located above the trailing edge adjacent the side walls of

the parachute to define an exit, the lower skin at said central recess having a steep angle and the lower skin adjacent the side



walls having a low or zero angle whereby the central recess provides stable forward drive.

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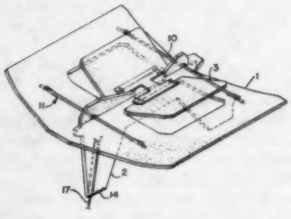
**4,389,032**

**RETRACTABLE WING KITE**

**Charles O. Meckley, 29520 SW. 199th Ave., Homestead, Fla. 33030**

**Filed Jul. 10, 1981, Ser. No. 282,175**
**Int. Cl.³ A63H *27/08***
**U.S. Cl. 244—153 R** **2 Claims**



1. A keel kite comprising:

a. an airfoil symmetrically shaped about a fore-and-aft centerline, said airfoil having a leading edge and a trailing edge,

b. a keel firmly connected to said airfoil at said centerline,

c. both said keel and said airfoil being made of substantially rigid material,

d. said airfoil having a first portion which is firmly fixed in a position substantially perpendicular to the keel; and two additional portions, one on each side of the centerline;

e. wherein said first portion of said airfoil has an aperture on each side of the centerline, each said aperture having at least one linear edge, said additional portions comprising flaps generally conforming to the shape of the apertures, means for hinging the first portions and the additional portions together, said means for hinging being attached to the linear edges of the apertures and the flaps so that the flaps can substantially close the apertures;

f. wherein said linear edges of said apertures are farther from the centerline than any other edges of said apertures;

g. resilient means holding said additional portions in the same plane as said first portion in a static condition, and moving said additional portions to an angle with respect to said first portion in response to pressure from wind when the kite is being flown whereby the area of the airfoil surface which provides lift changes in proportion to the strength of the wind;

h. wherein said resilient means is an elongated flexible band having two ends, one end of said band being secured to an intermediate point on one of said flaps, and the other end of said band being secured to a correspondingly located intermediate point on the other of said flaps, said band being stressed to hold the flap closed in a static condition, and being stretched in response to wind pressure to open the flaps when the kite is being flown.

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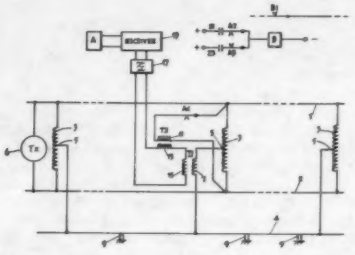
**4,389,033**

**BROKEN RAIL/BOND DETECTORS**

**Arthur R. Hardman, Cheshire, England, assignor to GEC-General Signal Limited, Hertfordshire, England**

**Filed Apr. 8, 1981, Ser. No. 251,849**
**Claims priority, application United Kingdom, Apr. 8, 1980, 8011539**
**Int. Cl.³ B61L *21/00*; G08B *21/00***
**U.S. Cl. 246—37** **7 Claims**



1. A circuit for detecting faults in a traction current return sub-system using a double rail return comprising

an impedance bond (3) connected between a pair of running rails (1,2),

first means (11,13), connected to said impedance bond, for detecting a track signal across said bond,

second means (17,19, A,A1), responsive to said first means, for operating to a distinctive condition in response to track signal detection by said first means and,

third means (5,7,15) responsive to a fault track signal in said bond for inhibiting said operation of said second means.

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**4,389,034**

**UNDERWATER PIPE ANCHORING DEVICE**

**Jefferies C. Suttles, Houston, Tex., assignor to Anchoring International, Inc., Houston, Tex.**

**Filed Jul. 21, 1980, Ser. No. 170,916**
**Int. Cl.³ F16L *1/04***
**U.S. Cl. 248—49** **10 Claims**

1. Pipeline anchoring device for anchoring a pipe to underground strata, comprising:

(a) a first support section shaped to engage a first portion of the outer surface of the pipe;

(b) a second support section shaped to engage a second portion of the outer surface of the pipe;

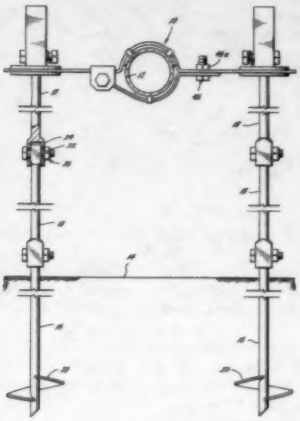
(c) hinge means for connecting a portion of the second support section to the first support section on one side of the pipe so that the second support section can swing into and out of a position where the support sections surround the pipe and engage opposite sides of the outer surface of the pipe;

(d) means for releasably connecting a portion of the second support section on the other side of the pipe from the hinge means to the first support section so that the support sections can be connected for supporting the pipe; and

(e) one of the support sections including at least one portion projecting outwardly away from the pipe and an opening in said portion; and

(f) anchor means including at least one elongated rod adapted to be driven into and become anchored in underground strata, an upper drive head on said rod of smaller cross-sectional dimensions than said opening, a drive

coupling adapted to fit over the drive head, lower bearing means larger than at least part of said opening connected to the coupling for engaging and holding the lower surface of the said portion, upper bearing means larger than



at least part of said opening and including an opening through which the drive coupling can project, and lock means for preventing the drive coupling from moving downward through the opening in said upper bearing means.

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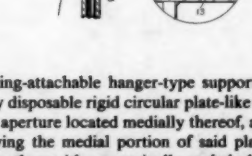
**4,389,035**

## HANGER-TYPE CEILING-ATTACHABLE SUPPORT HAVING SELF-DISPENSING CEMENT

**James D. Freeman, 11 W. Grand Ct., Springfield, Ill. 62704**

**Filed Nov. 6, 1980, Ser. No. 204,646**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—542** **10 Claims**



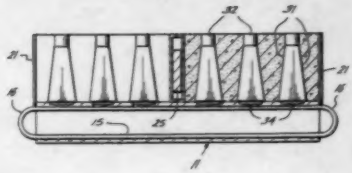
1. A ceiling-attachable hanger-type support comprising: a horizontally disposable rigid circular plate-like element having at least one aperture located medially thereof, a cup-like member underlying the medial portion of said plate-like element and defining therewith a marginally sealed chamber, a short rigid post-like hanger-part depending axially from said cup-like member, and an initially liquid quickly-setting cement in said chamber, said chamber being so volume-variably constructed that an upward force exerted against said hanger-part will cause said cement to flow through said aperture and between said plate-like element and a ceiling surface juxtaposed thereto, and said cement being sufficiently viscous initially to hold said support in desired position while said cement hardens.

**4,389,036**

## APPARATUS AND METHOD FOR FORMING CONCRETE BLOCKS, PANELS AND THE LIKE

**Yousef Abou-Ezzeddine, 5821 Lynbrook, Houston, Tex. 77057**

**Filed Apr. 21, 1981, Ser. No. 256,064**
**Int. Cl.³ B28B *7/10*; B29C *1/14***
**U.S. Cl. 249—120** **11 Claims**



1. Apparatus for forming concrete blocks and the like, the combination comprising:

a pallet having a generally flat upper surface and having a plurality of grooves provided in said upper surface;

a generally rectangular mold frame having four integral and generally vertically upstanding sides, said frame being open on the top and bottom and dimensioned for matably mounting on said pallet, said frame having a plurality of generally vertical partition walls extending between at least two of said side walls forming a plurality of mold cavities open on the upper ends thereof for receiving aggregate therein;

at least one mold core mounted within each of said mold cavities and connected to said grooves in said pallet, each of said cores having sides tapered generally inwardly toward the top thereof whereby said cores remain supported on and connected to said pallet when said frame is separated from said pallet;

and means for separating said rectangular frame from said pallet after aggregate has been poured into said mold cavities and initial setting thereof has occurred to form blocks while said cores remain in contact with said blocks and said blocks remain in contact with and are supported on said pallet.

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**4,389,037**

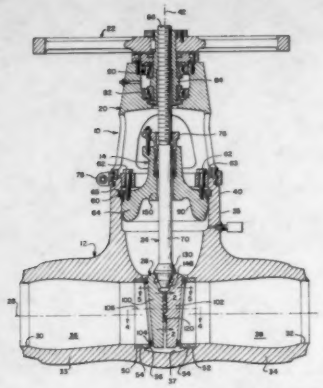
## DOUBLE DISC GATE VALE WITH REPLACEABLE SPACER RING

**Ronald J. Anders, Raleigh, N.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 605,277, Aug. 18, 1975, abandoned. This application Jun. 13, 1980, Ser. No. 159,017**
**Int. Cl.³ F16K *3/12***
**U.S. Cl. 251—327** **12 Claims**

1. A gate valve comprising: a valve body having flow passages communicating with a central valving control chamber; valve seats in the valve body at the ends of the flow passages adjacent the control chamber; a two piece gate movable between an open position and a closed position by an external stem assembly operably connected to said gate; a seating surface formed on one side of each of said gate pieces sealingly engageable with its respective said valve seat in the closed position when opposed surfaces respectively of the other side of each of said gate pieces are spaced a predetermined distance apart; a single rigid spacer member remote from said stem assembly having end surfaces respectively engaging said opposed surfaces and having a thickness therebetween equal to said predetermined distance; projecting capturing means on each of said gate pieces bounding a peripheral wall of said spacer member and projecting from said opposed surfaces an effective combined distance less than the thickness of the spacer member; said spacer member being circular and having a circular peripheral wall which is the outer circumferential

wall of said member and is bounded by said projecting capturing means; said spacer member having a central circular open-



ing formed therein; and guide means preventing separation of the pieces during gate movement and disengagement of the capturing means.

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**4,389,038**

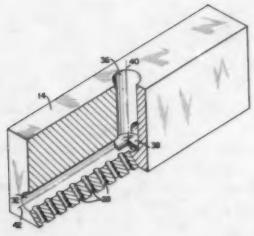
## SCARFING APPARATUS

**Ronald E. Fuhrhop, West Nyack, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Jan. 11, 1982, Ser. No. 338,203**

**Int. Cl.³ B23K** *7/06*

**U.S. Cl. 266—51** **8 Claims**



1. Scarfing apparatus for thermochemically treating a metal surface including a desurfacing head having an output discharge means for discharging a gas into a slot-like scarfing nozzle defined by an upper and lower preheat block, output discharge means in each preheat heat block for discharging gas, and a gas distribution assembly for distributing gas evenly across at least one of said output discharge means, wherein said gas distribution assembly comprises:

a manifold discharge chamber communicating with said output discharge means;

an inlet supply chamber adapted to be connected to a supply source of fuel gas or oxygen and interconnecting said manifold discharge chamber to form a ledge; and

a flow redistribution member supported upon said ledge at the intersection between said inlet supply chamber and said manifold discharge chamber for redirecting gas flow from said inlet supply chamber into said manifold discharge chamber.

**4,389,039**

## CUTTING TORCH GUIDE AND ACCESSORIES THEREFOR

**Franklin W. Domres, 4117 Crescent Beach Rd., Manistee, Mich. 49660**

**Continuation-in-part of Ser. No. 235,524, Feb. 18, 1981, abandoned. This application Sep. 8, 1981, Ser. No. 299,879**

**Int. Cl.³ B23K** *7/10*

**U.S. Cl. 266—77** **46 Claims**

1. A stand for supporting a portable cutting torch guide comprising:

a base adapted to be abuttingly supported on a surface;

a platform connected with and supported above said base at a preselected, convenient working height; said platform being normally horizontally oriented, and shaped to abuttingly support thereon articles to be cut; and

a pedestal having one end connected with said base, and the other end including means for detachably supporting the cutting torch guide thereon, and positioning the cutting torch guide over at least a portion of said platform, at an elevation substantially level with or above the height of said platform.

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**4,389,040**

## APPARATUS FOR SEPARATING A SPONGE IRON PRODUCT PRODUCED IN A ROTARY FURNACE

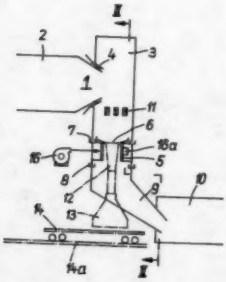
**Klaus Ulrich, Heiligenhaus; Wilhelm Janssen, Mülheim, and Reinhard Herbrig, Duisburg, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

**Filed Jun. 11, 1982, Ser. No. 387,540**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123589**

**Int. Cl.³ F27B** *7/32*

**U.S. Cl. 266—137** **12 Claims**



1. Apparatus for the hot separation of sponge iron from the hot discharge material of a rotary furnace having a discharge end; comprising a discharge chamber connected to said discharge end of said rotary furnace for receiving hot discharge material from said rotary furnace; a vibratory screen being positioned at a lower end of said discharge chamber for receiving the discharge material from said discharge chamber; support means carrying said vibratory screen; means to cool said support means; sealing means for sealing said vibratory screen and said support means from the ambient environment; means for moving said support means with respect to said lower end of said discharge chamber; screen drive means operatively connected to said vibratory screen and carried by said support

means; and a discharge chute carried by said support means and disposed underneath said screen for discharging the portion of the hot discharge material which passes through said screen.

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**4,389,041**

## PYROMETALLURGICAL FURNACE SYSTEM WITH READILY REMOVABLE WALL SECTIONS

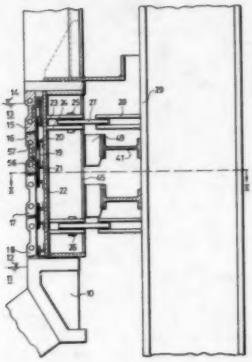
**Friedrich Megerle, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**

**Filed Sep. 29, 1982, Ser. No. 426,619**

**Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139278**

**Int. Cl.³ C21B *7/10***

**U.S. Cl. 266—194** **10 Claims**



1. In a pyrometallurgical furnace system including furnace walls in which at least the areas of such walls which come in contact with molten metal are provided with cooling elements through which a coolant circulates, the improvement which comprises:

at least one cooling element carrier,

a plurality of adjacent cooling elements each releasably secured to said cooling element carrier,

support means fixedly secured with respect to said furnace, and

pivotal means interconnecting said support means with said cooling element carrier permitting the same to be pivoted into a position providing access to the cooling elements releasably secured to said cooling element carrier.

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**4,389,042**

## VACUUM DEGASSING APPARATUS

**Peter J. Wynne, Pittsburgh, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.**

**Filed Jan. 4, 1982, Ser. No. 336,898**

**Int. Cl.³ C21B *7/10***

**U.S. Cl. 266—210** **15 Claims**

1. Vacuum degassing apparatus including first and second vacuum degassing vessels,

coupling means for connecting each vessel to a vacuum system for reducing the pressure therein,

each vessel having at least one nozzle extending from its lower end whereby molten metal can be drawn into said vessel for being degassed,

supporting means,

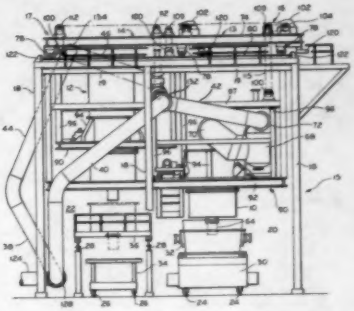
first and second transport means each including a vessel support, said first and second vessels being mounted respectively on said first and second vessel supports,

said first and second transport means being mounted respectively on said supporting means,

said first and second transport means being mounted in a side-by-side relation and each being movable in a direction generally parallel to that of the other for transporting its associated vessel between a treatment position and a service position,

means for transporting a container of metal beneath the treatment positions of each vessel,

each said first and second transport means including elevating means coupled to its vessel support so that each vessel may be elevated and lowered individually when each is in its treatment or service positions,



and connecting means connected to each of said vessels and to said coupling means for providing a vacuum connection therebetween, said connecting means being constructed and arranged to maintain said vacuum connections as said vessels are moved between their treatment and service positions and during the raising and lowering thereof.

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**4,389,043**

## METALLURGICAL MELTING AND REFINING UNIT

**Ralph Weber, Sao Paulo, Brazil, and William Wells, Charlotte, N.C., assignors to Korf Industrie und Handel GmbH und Co KG, Baden-Baden, Fed. Rep. of Germany**

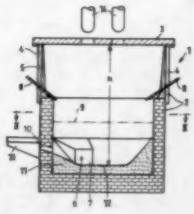
**PCT No. PCT/EP80/00151, § 371 Date Jun. 16, 1981, § 102(e) Date Jun. 16, 1981, PCT Pub. No. WO81/01862, PCT Pub. Date Jul. 9, 1981**

**PCT Filed Dec. 19, 1980, Ser. No. 276,362**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951825; Dec. 21, 1979, 2951826**

**Int. Cl.³ C21B *3/00***

**U.S. Cl. 266—218** **14 Claims**



1. Metallurgical melting and refining unit having a furnace vessel with a bottom and sidewall, two primary tuyeres extending through said sidewall and having a horizontal axis, and discharging below the surface of the melt in the vessel, said tuyeres being disposed in benches of refractory material on the bottom of the furnace vessel, at least one secondary tuyere extending through said sidewall and discharging above the melt surface, and a tap hole for the melt in the bottom area of the furnace vessel, said furnace vessel being in the form of a round hearth furnace, with a ratio of the inside dimensions

diameter (d) to height (h) of the furnace vessel between 0.8 and 2.5, said tuyere benches being located on opposite sides of the tap hole and adjacent thereto, said vessel bulging outwardly in the area of said tuyere benches, and said tuyere benches being offset outwardly in axial direction of said primary tuyeres.

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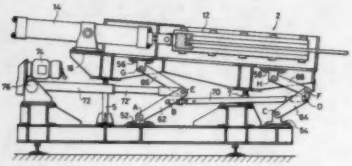
**4,389,044**

## MECHANICAL PUNCHING APPARATUS FOR COPPER SMELTING CONVERTER

**Yukio Iyama; Masao Fujita, and Nobuhiro Higashiiriki, all of Oita, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan**

**Filed Jul. 13, 1981, Ser. No. 282,829**
**Claims priority, application Japan, Sep. 8, 1980, 55-123522**
**Int. Cl.³ C21C** *5/46*
**U.S. Cl. 266—271** **5 Claims**



1. A mechanical punching apparatus comprising:
a mechanical puncher with a punching rod adapted for punching a converter tuyere;
a carriage supporting said mechanical puncher, said carriage being adapted to move said mechanical puncher in a longitudinal direction of a converter;
link means arranged between said mechanical puncher and said carriage for tilting said mechanical puncher;
motion regulating means for causing, in cooperation with said link means, motion of said mechanical puncher effected by said link means to be along a predetermined locus having a center at a center of rotation of said converter,
said link means comprising: first and second levers having first ends spaced apart from each other and pivotally secured to said carriage; third and fourth levers having first ends spaced apart from each other and pivotally secured to said mechanical puncher and second ends pivotally secured to second ends of said first and second levers; a coupling rod coupled pivotally between said first and second levers; and drive means provided on said carriage for operating said link means, said drive means comprising a generally horizontally oriented piston coupled to said link means, lengths of predetermined ones of said first through fourth levers being different from one another and being such that operation of said drive means causes said mechanical puncher to be moved along said predetermined locus having as a center a center of rotation of said converter.

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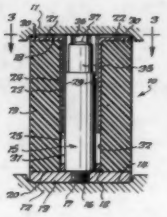
**4,389,045**

## LIQUID ENERGY ABSORBER DEVICE

**Douglas P. Taylor, North Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.**

**Continuation of Ser. No. 115,949, Jan. 28, 1980, abandoned. This application Jan. 26, 1982, Ser. No. 342,799**
**Int. Cl.³ B60G** *13/00, 15/00;* **F16F** *9/00, 11/00*
**U.S. Cl. 267—8 R** **16 Claims**

1. A liquid energy absorber device comprising an elongated liquid energy absorber member having a casing and a piston movable into and out of said casing, an annular elastomeric member surrounding said casing of said liquid energy absorber member in an axial direction for substantially the entire length thereof, means at opposite end portions of said elastomeric member for receiving varying forces due to changes in external loading on said liquid energy absorber device, said casing of said liquid energy absorber member and said annular elastomeric member having a variable size space formable therebetween as a result of distortion of said elastomeric member resulting from said changes in loading thereon with said space being of increased size when said elastomeric member is distorted and being of decreased size when it is not distorted, and duct means for conducting air into said variable size space from the atmosphere in response to the increasing in size of said space upon the distortion of said elastomeric member for cooling said liquid energy absorber member and said elastomeric member and for conducting air from said variable size space in response to the decreasing in size of said space.



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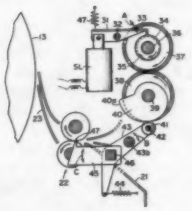
**4,389,046**

## SHEET FEEDING MECHANISM FOR IMAGE FORMING APPARATUS

**Toshirou Kasamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 18, 1980, Ser. No. 208,041**
**Claims priority, application Japan, Nov. 26, 1979, 54-152623**
**Int. Cl.³ B65H** *7/02*
**U.S. Cl. 271—227** **2 Claims**



1. In an apparatus wherein an image forming process is repeated at a regular cycle for forming images of an original, an improvement including a mechanism for feeding copy sheets at regular intervals, said mechanism comprising:
first detecting means for detecting a position of an original to generate a signal to register the original and the sheet;
second detecting means for detecting the feeding of a last said sheet to be fed out;
a cam member continuously rotatable at the speed of said cycle;
a repeatedly operable timing member, responsive to said cam member, for stopping and releasing the sheets along a sheet conveying path at a predetermined position according to said cycle to feed the sheets in a timed relation; and
a control member movable between a first position wherein said cam member, in response to an initial signal produced by said first detecting means, is allowed to rotate continuously, and a second position wherein said cam member, in response to the signal produced by said second detecting means, is stopped.

4,389,047

## ROTARY EXERCISE DEVICE

Lawrence W. Hall, 2411 Prospect, #307, Hermosa Beach, Calif. 90254

Filed Jan. 2, 1981, Ser. No. 222,279
Int. Cl.³ A63B 19/04
U.S. Cl. 272—69 8 Claims

1. A rotary exercising device for power generation, comprising:

a cylindrical light weight mill wheel of a size sufficient to allow a normal-sized adult to run within said mill wheel to rotate said mill wheel;

support wheels for said mill wheel having axes parallel to the axis of said mill wheel, said support wheels being rotatably mounted so that said mill wheel rotates freely upon said support wheels;

a base for mounting said support wheels and said mill wheel without interfering with the rotation of said mill wheel and said support wheels;

a driveshaft rotatably mounted to said base;

a contact wheel in frictional contact with said mill wheel so that rotation of said mill wheel produces rotation of said contact wheel;

ratchet means connected between said contact wheel and said driveshaft for permitting said contact wheel to drive said driveshaft and for permitting deceleration of said mill wheel and said contact wheel relative to said driveshaft;

a generator connected to said driveshaft so that the armature of said generator turns when said driveshaft turns to generate power when said mill wheel is turned by a user running or jogging within said mill wheel; and

storage means for storing the power generated by said generator.

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4,389,048

## APPARATUS FOR PLAYING A SPECTATOR-CONTROLLED GAME

Donald M. Burgess, 7A Sidney Pl., London, England (SW7 3NL)

Continuation-in-part of Ser. No. 83,152, Oct. 5, 1979, abandoned. This application Dec. 10, 1981, Ser. No. 329,194
Claims priority, application United Kingdom, Oct. 7, 1978, 39715/78
Int. Cl.³ A63F 7/02, 9/22
U.S. Cl. 273—121 A 12 Claims

1. Apparatus for playing a spectator-controlled game comprising

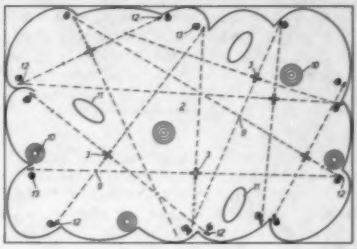
means constituting a playfield for playing said game;

means constituting at least one object movable over the playfield under the control of at least three spectators when playing said game;

at least one controllable object-influencing means for causing or modifying movement of said object over said playfield in one of a plurality of different ways, when activated by an appropriate kind of control signal;

a plurality of control means, each being operable by a respective spectator when playing said game to select and supply a desired one of a plurality of possible output signals for controlling the operation of said object-influencing means; and

a decision-making logic system connected (a) to the respective said control means so as to receive therefrom said output signals selected by said spectators, and (b) to said object-influencing means so as to supply hereto in response to said received output signals and as said control signal a signal dependent on a predetermined majority of one sort of said received output signals over the other sorts of said received output signals, whereby to cause said object-influencing means to respond to the expressed wishes of a predetermined majority of the spectators operating the respective control means.



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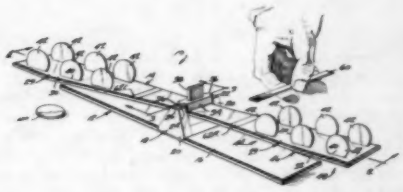
4,389,049

## COMPENSATOR FOR BEAM OF BALANCE SCALE OF COUNTERFEIT COIN-IDENTIFICATION GAME

Roland H. Wiley, 2021 W. Charleston, Las Vegas, Nev. 89102

Filed Dec. 16, 1981, Ser. No. 331,202
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R 5 Claims



1. A modest cost apparatus for demonstrating the classical solution to the twelve coins/three weighings problem, where one of twelve coins, a "counterfeit", is substantially but not perceptably different in weight from the individual weight of each of eleven "genuine" coins, though of the same appearance, and the object is to single-out the counterfeit coin and to determine whether it is heavier or lighter than a said genuine coin,

said apparatus comprising, in addition to a set of twelve such coins:

a balance scale including a base with a fulcrum, and a two-armed balance beam pivotally supported on the fulcrum of the base;

means on each balance beam arm designating corresponding sites for placement of six of the coins;

means marking a corresponding site on each balance beam arm for disposition of a compensator element on the balance beam; and

a compensator element of such relative weight to each of the coins as to have these characteristics:

that when there is a corresponding number from one to six of correspondingly located ones of said coins placed at

respective ones of said sites on said balance beam arms, and said balance beam has assumed a tilted disposition so as to have a high side, and said compensator element is disposed on the high side of the balance beam at said corresponding marked site, the balance beam pivots and oppositely tips down, so that what was the high side becomes the low side only when all of the coins then disposed on the balance beam are "genuine" coins, but the balance beam remains tilted so that what was the high side remains the high side only when one of the coins then disposed on the balance beam is a "counterfeit" coin.

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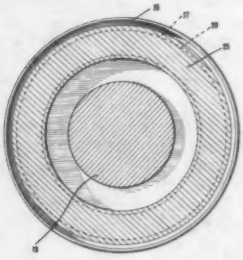
**4,389,050**

## MECHANICAL SEAL HAVING A SEAL INSERT MOUNTED IN A LAMINATED SHELL

**Norman E. Johnson, Barrington, and Harold F. Greiner, Warwick, both of R.I., assignors to EG&G Sealol, Inc., Warwick, R.I.**

**Filed Jul. 16, 1982, Ser. No. 398,927**
**Int. Cl.³ F16J *15/34***
**U.S. Cl. 277—26** **5 Claims**



1. A mechanical face seal comprising rotatable and non-rotatable members rubbingly engageable along substantially radial faces, one of said members including a holder formed by a plurality of bands which are press fitted to one another, the outermost band being in tension and the innermost band in compression so that the stresses in the bands tend to balance one another, and an annular insert press-fitted into the holder and formed with one of said rubbingly engageable faces.

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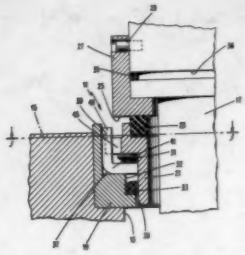
**4,389,051**

## PRESSED IN ANTI-ROTATION LUGS FOR MECHANICAL FACE SEALS

**John J. Mullaney, Warwick, R.I., assignor to EG&G Sealol, Inc., Warwick, R.I.**

**Filed Jul. 15, 1982, Ser. No. 398,359**
**Int. Cl.³ F16J *15/34***
**U.S. Cl. 277—41** **8 Claims**

1. A seal assembly comprising a stationary housing adapted to be fixed to a container at an opening, said housing having an opening aligned with the container opening and adapted to receive a rotatable shaft, a seal ring supported by said housing, a mating ring fixed to said shaft and cooperably engaging said seal ring, means preventing relative rotation between said housing and seal ring and allowing axial movement therebetween including a ring disposed in said housing opening and formed with lug means which are elastically deformed by engagement with the surface of said housing forming said opening, whereby said ring is non-rotatably secured to said housing, abutment means on said seal ring engaging said lug means to prevent rotation of said seal ring relative to said



housing, said engaged lug means and abutment means allowing axial movement of said seal ring relative to said housing.

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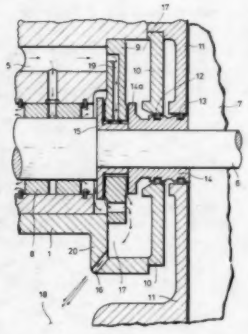
**4,389,052**

## OIL SEAL SYSTEM FOR SHAFT OF TURBOCHARGER

**Masami Shimizu, Chiba, and Junji Yasunobe, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 19, 1980, Ser. No. 160,961**
**Claims priority, application Japan, Jul. 10, 1979, 54-94989[U]**
**Int. Cl.³ F16J *15/40***
**U.S. Cl. 277—67** **4 Claims**



1. In an oil seal system for the shaft of a turbocharger having a turbine and impeller mounted thereon in axially-spaced relation and an oil-trapping chamber formed by components thereof, in combination:

(a) a combined turbine-impeller mounting shaft having a shoulder formed thereon inward from the impeller mounting portion thereof;

(b) a bearing casing surrounding said shoulder and portions of said shaft on either side thereof;

(c) a seal plate mounted to seal said casing and positioned between said impeller and said shoulder;

(d) an oil thrower fitted on said shaft and having a first portion within said seal plate, a second portion extending axially towards said shoulder and having an oil-throwing flange formed thereon spaced outwardly from said shoulder;

(e) a seal ring interposed between said oil thrower and said seal plate;

(f) a thrust bushing fitted on said shaft and having one end abutting said shoulder and an opposite end abutting said oil-thrower flange; and

(g) a thrust metal fixedly secured to said casing and surrounding in radially spaced relation a portion of said

thrust bushing between said shoulder and said flange, said thrust metal having channels formed therein communicating with an oil supply enabling a flow of oil from such supply to flow on selected surfaces of said thrust bushing and said oil thrower and from such surfaces flow to a said oil trapping chamber below said oil thrower, said trapping chamber being formed by said casing, seal plate, oil thrower, seal ring, and thrust metal and having an oil discharge port extending through the bottom portion thereof with said oil-throwing flange being disposed within said chamber.

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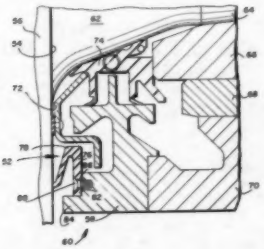
**4,389,053**

## WATER GUARD FOR ROLLING MILL OIL FILM BEARING

**Charles L. Innis, Jr., Paxton; Lowell S. Salter, Jr., Shrewsbury; Harry Boghosian, Worcester, all of Mass., and Donald H. Wilkinson, Palmyra, N.Y., assignors to Morgan Construction Company, Worcester, Mass.**

**Filed Mar. 26, 1982, Ser. No. 362,109**
**Int. Cl.³ F16J** *15/32, 15/34*
**U.S. Cl. 277—95** **8 Claims**



1. In a rolling mill wherein the neck of a roll is rotatably supported in an oil film bearing contained in a bearing chock, with a seal assembly located between the roll end face and the bearing chock to retain oil in the bearing and to exclude contaminants such as cooling water, mill scale, etc. from the bearing, the said seal assembly including a circular seal end plate fixed relative to the bearing chock at a location surrounding a flexible seal mounted on the roll neck for rotation therewith, the improvement comprising: a circular water guard having a radially extending mounting flange integrally joined at its inner edge to an angularly outwardly extending sealing flange, said mounting flange being adapted to be surrounded by and to be secured to the seal end plate, said mounting flange providing the sole means for supporting and maintaining said sealing flange in frictional contact with the roll end face, both of said flanges being elastically flexible with said mounting flange having a rigidity which is greater than that of said sealing flange.

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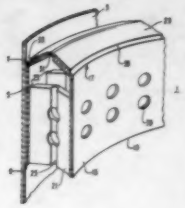
**4,389,054**

## SHOCK ABSORBENT GAS SEAL

**Yuen F. Lee, Cupertino, and Shiro Aisawa, Sunnyvale, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 28, 1981, Ser. No. 287,612**
**Int. Cl.³ F16J** *15/32*
**U.S. Cl. 277—214** **7 Claims**

1. A shock absorbent seal comprising an outer arcuate pad having upper and lower arcuate margins, an inner arcuate pad having upper and lower arcuate margins, a plurality of chevron shaped struts disposed in a spaced relationship between said arcuate pads and extending upwardly from the lower margins thereof, and an arcuate chevron shaped cap integrally connected to the upper margins of the arcuate pads and disposed in a spaced relationship with respect to the chevron shaped struts.



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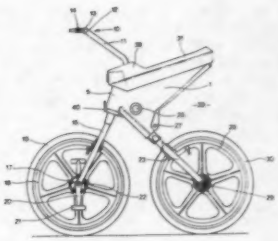
**4,389,055**

## VELOCIPEDE

**Paul A. Cockburn, 1 Caledonia St., Paddington, New South Wales 2021, Australia**

**Filed Nov. 7, 1980, Ser. No. 205,050**
**Claims priority, application Australia, Nov. 15, 1979, PE1340**
**Int. Cl.³ B62K** *19/08*
**U.S. Cl. 280—274** **5 Claims**



1. A velocipede including:
a longitudinally elongated central unitary frame having a forward portion providing a headstock and a rear portion extending rearwardly from said forward portion;
one or more bearings arranged in the headstock;
a spindle rotatably mounted on the headstock so as to be rotatably supported by said bearings for rotation about a generally vertical axis;
handle bars attached to the upper end of said spindle, front forks attached to the lower end of said spindle, a front wheel rotatably supported between said front forks and a set of pedal cranks operable on said front wheel;
a fixed non-adjustable elongated seat directly supported on said rear portion so as to extend therealong and provide a seating surface extending upwardly and rearwardly from said headstock;
a rear frame supported by said central frame and extending downwardly and rearwardly from said headstock; and
at least one rear wheel rotatably mounted on said rear frame.

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**4,389,056**

## WHEELCHAIR

**David M. Tenniswood, Troy, Mich., assignor to Creative Controls, Inc., Troy, Mich.**

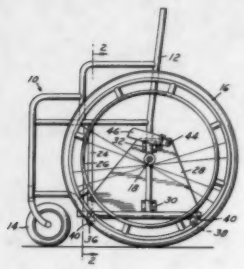
**Filed Oct. 20, 1980, Ser. No. 198,728**
**Int. Cl.³ B62B** *11/00*
**U.S. Cl. 280—289 WC** **8 Claims**

1. In a wheelchair of the type having a pair of light frame members, a pair of large rear wheels and small forward wheels,

one of each pair being attached to and outward of each light frame member for moving the chair, and a seat extending between said light frame members, an improvement comprising:

a pair of metal plates aligned along side the rear wheels, one of each plates on the inside of each light frame member and located below said seat;

a first portion of each of said metal plates extending rearwardly and below where said large wheels are attached to



said light frame and a second portion extending forwardly and below where said large rear wheels are attached to said light frame;

a pair of cross bars, one of said cross bars extending between said first portions and the second set of cross bars extending between said second portions, said cross bars being rigidly but releasably held by said plates; a seat belt extending between said plates and over said seat for releasably retaining an occupant in said seat and attachment means for joining said seat belt to said metal plates.

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**4,389,057**

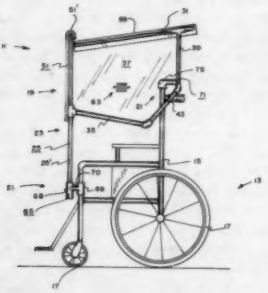
**WHEELCHAIR COVER**

**Spence Richard, Jr., Rte. 1, Box 295, Lamar, Miss. 38642**

**Filed Jun. 5, 1981, Ser. No. 270,787**

**Int. Cl.³ B62J *23/00***

**U.S. Cl. 280—289 WC** **9 Claims**



1. The combination with a wheelchair of a protector means for protecting the user of a wheelchair, said protector means comprising:

(a) cover means for covering at least a portion of the user of the wheelchair, said cover means including a clear front member for protecting the face of the user of the wheelchair, said front member having an upper edge;

(b) attachment means for attaching said cover means to the wheelchair, said attachment means including first and second anchor means for being secured to the front of the wheelchair; and

(c) frame means for supporting said cover means on the wheelchair, said frame means including first and second substantially vertical front post members, each of said first and second front post members having a lower end and an upper end, said lower end of said first front post member being removably attached to said first anchor means, said lower end of said second front post member being removably attached to said second anchor means, said frame means including a substantially horizontal front cross bar member, said front cross bar member having first and second ends, said first end of said front cross bar member being attached to said upper end of said first front post member, said second end of said front cross bar member being attached to said upper end of said second front post member, said upper edge of said front member of said cover means being pivotally attached to said front cross bar member.

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**4,389,058**

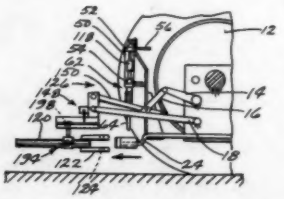
**HITCH ASSEMBLY**

**Vyrl E. Cadwell, Rte. 2, Box 50, Manilla, Iowa 51454**

**Filed Apr. 15, 1981, Ser. No. 254,404**

**Int. Cl.³ B60D *1/10***

**U.S. Cl. 280—415 A** **13 Claims**



1. A hitch assembly for a tractor having a three point lift comprising a pair of spaced apart lift arms and an upper lift link, said tractor further having a tractor draw bar attached thereto and extending rearwardly therefrom, said hitch assembly comprising:

a hitch frame;

a hitch draw bar connected to said frame and having a vertically disposed pin receiving hole therein;

a vertically extendible power means connected to said frame above said pin receiving hole, said power means having an extensible member movable upon actuation of said power means from a retracted elevated position to an extended lowered position;

a pin assembly connected to said extensible member and including an elongated vertically disposed coil spring and a locking pin, said coil spring having an upper end connected to said extensible member and a lower end connected to said pin and yieldably holding said pin in vertical registered alignment with said pin receiving hole;

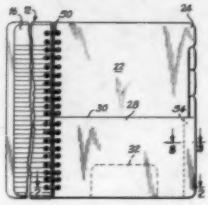
said pin normally being fitted within said receiving hole when said power means is in said extended position and being spaced upwardly therefrom when said power means is in said retracted position; and

said coil spring being yieldably flexible intermediate its said upper and lower ends whereby said coil spring will yieldably deflect in any direction when said pin encounters a resistance of predetermined magnitude during downward movement of said extensible member of said power means.

## 4,389,059
## SEAT BELT WEBBING GUIDE

Robert L. Stephenson, Utica, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 10, 1980, Ser. No. 205,225
Int. Cl.³ A44B 11/00; A62B 35/00; B60R 21/10
U.S. Cl. 280—808 11 Claims

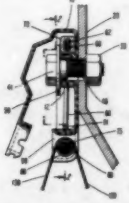


1. A seat belt web guide, comprising:
(a) load bearing flexible wire loop means having upper and lower loop portions wherein said loop means is shaped to define a loop opening large enough to receive seat belt webbing, wherein said loop means is adapted to be secured to a load supporting area of the vehicle structure;
(b) guide means for maintaining only the lower portion of said flexible wire loop means substantially straight for supporting and guiding said seat belt webbing passing through the loop means, said guide means comprising a tube element surrounding said lower loop portion for supporting seat belt webbing passing partially around the guide means and through the loop means;
(c) fastening means adapted to be secured to a vehicle structure for securing said loop means to the vehicle structure, said upper loop portion extending around said fastening means;
(d) a housing structure containing said loop means, including a recessed portion defined by two end flanges, said flanges being formed with apertures for mounting said tube element therebetween; and
(e) roller means surrounding said tube element for rollably supporting said seat belt webbing.

## 4,389,060
## TABBED POCKET FOR USE IN RING BINDER AND WIRE BOUND BOOKS

Robert C. Cline, Washburn Rd., Saugerties, N.Y. 12477

Filed Feb. 4, 1981, Ser. No. 231,418
Int. Cl.³ B42B 5/12; B42D 13/00; B42F 21/02
U.S. Cl. 281—38 1 Claim

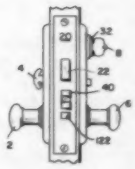


1. A loose-leaf book comprising front and back covers, a filler between said covers and comprising page sheets and a plurality of divider sheets interposed between successive groups of page sheets, said page sheets and said divider sheets having registering perforations on an alignment between upper and lower edges of the sheets and at marginal offset from a common binding lateral edge, and an array of wire-loop formations extending through the registering perforations and binding said filler between said covers; said divider sheets having index-tab formations extending outward from the lateral edge opposite the binding edge to an extent at least equal to the bound marginal offset of said perforations from said binding edge, and said index-tab formations being distributed along substantially the upper half of the lateral edge opposite the binding edge; front and back pocket-sheet panels enclosing substantially the lower half of each divider sheet to substantially the full extent of index-tab projection and edge binding, said pocket-sheet panels having edge-binding perforations which register with corresponding perforations of the associated divider sheet and being bound by said loop formations, a bent closure of front and back pocket-sheet panels to each other at the lower edge of the associated divider sheet, and a bent closure of said front and back pocket-sheet panels to each other at the lateral edge alignment of the index-tab formation of the associated divider sheet; whereby a page sheet removed from edge-bound relation to said book may, without folding, be insertably received in either of the pockets of each divider sheet, without interfering with the bound relation of remaining page and divider sheets of said filler.

## 4,389,061
## MORTISE LOCK WITH IMPROVED DEADLOCK RELEASE MECHANISM

William R. Foshee, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Jan. 12, 1981, Ser. No. 224,380
Int. Cl.³ E05C 1/16
U.S. Cl. 292—169.14 15 Claims



1. A mortise lock, comprising
a case including a front,
a dead bolt mounted in the case for movement through the front between retracted and projected positions,
a key-operated cylinder mounted in the case and means operable thereby for projecting and retracting the dead bolt,
a latch mounted in the case for movement through the front between retracted and projected positions and biased to projected position, a tailpiece connected to the latch and having a rearward-spaced tailplate by which the latch is retracted,
a cylinder latch lever for retracting the latch in response to key operation of the cylinder,
a deadlocking lever for deadlocking the latch and means for positioning the deadlocking lever in deadlocking position when the lock is in door-closed relation with a strike,
an inner knob hub mounted for rotation in the case and having a roll-back cam thereon, and a hub lever mounted in the case and movable by such cam in a direction to retract the latch,
wherein the improvement comprises
a cam block mounted in the case for movement aginst said tailplate for retracting the latch, and having a release cam thereon,
said deadlocking lever having a blocker arm movable into the path of the latch to deadlock it against retraction, means to bias said deadlocking lever toward deadlocking position, said deadlocking lever also having a release arm with a cam ramp thereon in the path of retraction move-

ment of the cam on said cam block for actuating the deadlocking lever to non-blocking position in response to initial retraction movement of the cam block,

said knob hub lever and cylinder latch lever both being arranged to drive said cam block in latch-retracting movement in response, respectively, to knob actuation of the hub lever and to cylinder actuation of the cylinder latch lever.

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**4,389,062**

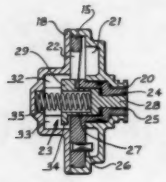
**ROTARY LATCH**

**Kenneth W. Rosenberg, St. Louis, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 15, 1980, Ser. No. 216,722**

**Int. Cl.³ E05C *3/04***

**U.S. Cl. 292—190** **5 Claims**



1. A rotary latch for engagement with a striker loop, said latch comprising,

a housing having a journaled bore, an enlarged bore and a semi-circular groove therein,

a cover closing said enlarged bore and said semi-circular groove, said cover having at least one locking slot therein,

latching means rotatably positioned in said journaled bore and having a hooked-shaped latch extending into said enlarged bore of said housing, said latching means having a locking slot therein,

stop means on said latching means extending into said semi-circular groove,

a shaft axially slidable within said latching means and having at least one locking lug slidably positioned in said locking slot in said cover and selectively engageable with said locking slot in said latching means, and

spring means biasing said shaft whereby said locking lug on said shaft is engaged with both said locking slot on said latching means and said locking slot in said cover to prevent rotation of said latching means.

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**4,389,063**

**REUSABLE TAMPER-INDICATING SECURITY SEAL**

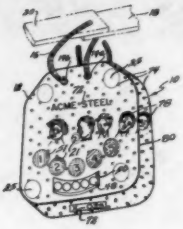
**Michael J. Ryan, Plainfield, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jun. 23, 1981, Ser. No. 276,611**

**Int. Cl.³ B65D *33/34***

**U.S. Cl. 292—307 R** **17 Claims**

1. A seal combination for detecting unauthorized tampering or substitution of a secured item, the improvement comprising the seal combination having a transparent wall, a first indicia disposed on the inside surface of the transparent wall, a second indicia provided over virtually all of the outside surface of the transparent wall, said second indicia having a uniformity such that any variation in the uniformity can readily be detected, a third indicia also covering at least part of the outside surface of the transparent wall, said third indicia having a pattern that is readily distinguished and easily committed to memory, and a cocoon of transparent mater. al over virtually all of the outside surface of the transparent wall and over the second and third indicia thereon, and said second and third indicia each being at least in part transparent so as to allow viewing therethrough of the underlying first indicia, whereby a parallax is established



when looking at the first indicia from an angle through the second and third indicia.

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**4,389,064**

**GRIPPING DEVICE OPERATING BY SUCTION**

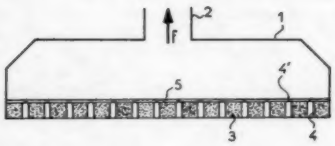
**Stanislas G. L. Laverriere, Villeneuve les Sablons, France, assignor to S.A. Joulin Sema, Etampes, France**

**Filed Nov. 24, 1981, Ser. No. 324,555**

**Claims priority, application France, Dec. 5, 1980, 80 25818**

**Int. Cl.³ B66C *1/02*; B32B *3/12, 3/24, 3/08***

**U.S. Cl. 294—64 R** **7 Claims**



1. A suction prehension device comprising, a casing having a base plate, means on said casing for connecting the casing to a source of suction, said base plate having a plurality of perforations therein for communicating suction from within the casing to an exterior face of the base plate, a layer of low density open cell foam material extending across and fixed to the exterior face of said base plate, said layer of foam material having an outside and a plurality of openings extending through the layer from the outside surface to the base plate, said openings communicating with the perforations of the base plate, said openings having internal surface, and means for limiting air flow through the internal surfaces of the openings from the open cell foam of the foam material to enable the outside surface of the foam material to assist prehension, said means comprising, an at least partially air tight covering on the internal surfaces of the openings.

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**4,389,065**

**WEED AND GRASS PULLER**

**Wallace E. Atkinson, Rte. 3, Box 656, Petersburg, Va. 23803**

**Filed Oct. 26, 1981, Ser. No. 315,042**

**Int. Cl.³ A01B *1/18***

**U.S. Cl. 294—50.8** **5 Claims**

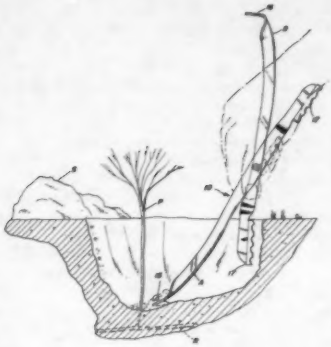
1. An implement for removing relatively deeply embedded weeds and unwanted grasses and the like comprising:

an elongated plier-type tool having elongated jaws and operatively associated molded pads of relatively soft rubber or plastic mounted on the jaw faces;

said pads having operatively associated corrugated faces whereby to inhibit slippage and to present a sinuous extent for root contact to enhance grasping of the root to be extracted without crushing, cutting or tearing and to facilitate extraction of the entire root;

the tool handles being elongated and each handle having an auxiliary tool at the free end thereof; and

one said auxiliary tool comprising a spade or trowel-like tool and the second auxiliary tool comprising a hoe or rake-like tool;



all of said tools complementing one another for the common purpose of exposing and removing in entirety the relatively deeply embedded root and to dress the ground surface after such removal.

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**4,389,066**

## RESCUE UNIT

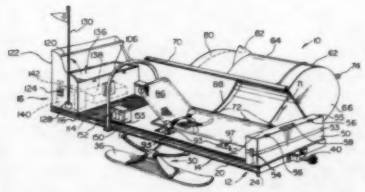
**Roy Weir, 1638 Dalton Rd., Timmins, Ontario, Canada (P4N 7C2); Larry G. Morin, and Louis D. Guenette, both of Sturgeon Falls, Canada, assignors to Roy Weir, Timmins, Canada**

**Filed Feb. 25, 1981, Ser. No. 237,819**

**Claims priority, application Canada, Nov. 7, 1980, 364324**

**Int. Cl.³ A61G *3/00***

**U.S. Cl. 296—19** **16 Claims**



1. A rescue unit adapted to be transported by a vehicle, comprising:

(a) frame means;

(b) transport assembly means attached to said frame means for permitting transport of the unit;

(c) a patient support section carried by said frame means and including cover means for said section, said cover means being movable to permit access to said patient support section;

(d) an attendant support section carried on said frame means longitudinally spaced from said patient support section in the direction of the head of a patient carried on said patient support section,

(e) said cover means comprising a first portion and a second portion, said first portion being hingedly connected with one side of said frame means, means for limiting hinged open movement of said cover, and said second cover portion being telescopingly movable with respect to said first cover portion,

(f) said second cover portion having a transparent section for association with a portion of the patient support section in the area of the head of a patient being carried on said unit,

(g) said second cover portion carrying a transparent windscreen adjacent the transparent section and forward of the attendant support section, and

(h) said attendant section including a transverse safety bar immediately rearwardly of said patient support section.

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**4,389,067**

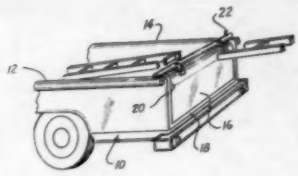
## TAILGATE PROTECTING DEVICE

**Arthur J. Rubio, 1505 De Rose Way, #10, San Jose, Calif. 95126**

**Filed Jan. 12, 1981, Ser. No. 224,633**

**Int. Cl.³ B62D *25/00***

**U.S. Cl. 296—50** **6 Claims**



1. A tailgate protecting device for pickup trucks, comprising:

an elongated horizontai support member forming a load carrying beam adapted to span the load carrying portion of a pickup truck and having a length such that each end extends over and rests upon the top of a side-wall of the truck;

a pair of vertical support members respectively affixed to said beam at predetermined distances from the ends thereof and forming load carrying legs the distal ends of which are adapted to rest upon the bed of the pickup truck; and

bracket means affixed to said beam for extending over the top of the tailgate of the truck to hold said device in position immediately adjacent thereto without transmitting any vertical load carried by said beam to said tailgate, said bracket means including a pair of L-shaped members each having one leg which is affixed to beam and extends laterally relative thereto, and another leg which extends downwardly and cooperates with one of said support members to form a slot for receiving the top edge of the truck tailgate.

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**4,389,068**

## DEVICE FOR FIXING A WINDOW MOLDING ONTO A WINDOWPANE

**Ikuo Sengoku, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Apr. 3, 1981, Ser. No. 250,736**

**Claims priority, application Japan, Nov. 5, 1980, 55/154571**

**Int. Cl.³ B60J *1/02***

**U.S. Cl. 296—206** **16 Claims**

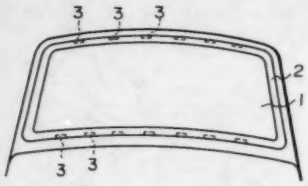
1. A windowpane assembly of a vehicle, which has a window molding and a windowpane arranged in an L-shaped cross-sectional fillister of a vehicle body, said fillister extending along an outer periphery of the windowpane and comprising a riser portion which extends inwardly from the vehicle body, and a bottom portion which extends substantially parallel to the vehicle body from an inner end of said riser portion, the windowpane being stuck onto the bottom portion by means of an adhesive material, a gap formed between the riser portion and the outer periphery of the windowpane being covered by the window molding which has a substantially C-shaped cross-section, said device having a molding clip inserted into the gap

for fixing the window molding onto the windowpane, said molding clip comprising:

a holding portion engageable with the C-shaped cross-section of said window molding;

an elastic curved base portion extending along the riser portion of the fillister and intended to resiliently abut against the outer periphery of the windowpane within the gap, said base portion having thereon grasping means to grasp the windowpane, said holding portion connected to said base portion;

a pair of latch arms comprising root portions which extend from longitudinal opposite ends of said base portion towards the outer periphery of the windowpane and have




tips, and arm portions which are spaced from said base portion and extend from the tips of said corresponding root portions so as to approach each other, said latch arms being engageable with a central portion of said base portion for maintaining said base portion in a compressed state to accumulate the elastic force of said base portion, and thereby deform said base portion from its uncompressed configuration, and;

disengaging means for disengaging said latch arms from the central portion of said base portion and causing said base portion to attempt to return to its uncompressed configuration, to thereby resiliently abut against the outer periphery of the windowpane.

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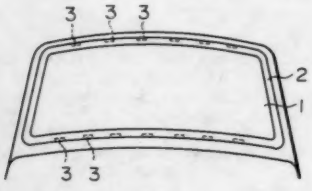
**4,389,069**

## METHOD OF AND A DEVICE FOR FIXING A WINDOW MOLDING ONTO A WINDOWPANE

**Ikuo Sengoku, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Apr. 3, 1981, Ser. No. 250,916**
**Claims priority, application Japan, Nov. 5, 1980, 55/154569**
**Int. Cl.³ B60J *1/00***
**U.S. Cl. 296—206** **24 Claims**




13. A windowpane assembly of a vehicle, which has a window molding and a windowpane arranged in an L-shaped cross-sectional fillister of a vehicle body, said fillister extending along an outer periphery of the windowpane and comprising a riser portion which extends inwardly from the vehicle body, and a bottom portion which extends substantially parallel to the vehicle body from an inner end of said riser portion, the windowpane being stuck onto the bottom portion by means of an adhesive material, a gap formed between the riser portion and the outer periphery of the windowpane being covered by the window molding which has a substantially C-shaped cross-section, said device having a molding clip inserted into the gap for fixing the window molding onto the windowpane, said molding clip comprising:

a holding portion engageable with the C-shaped cross-section of said window molding;

elastic wing members intended to resiliently abut against the outer periphery of the windowpane within the gap, said elastic wing members being connected to the bottom of said holding portion;

claw members each engageable with a respective one of said elastic wing members for maintaining said elastic wing members in a compressed state to accumulate the elastic force of said elastic wing members, wherein said claw members are connected to the bottom of said holding portion; and

projection means extending from the bottom of said holding portion, wherein said elastic wing members, said claw members, and said projection means are attached to said holding portion so that when said molding clip is engaged with said window molding and pressed toward the windowpane, the projection means abut against a front face of the windowpane and when further pressure is applied to said molding clip, the elastic wing members are disengaged from said claw members and abut against the outer periphery of said windowpane.

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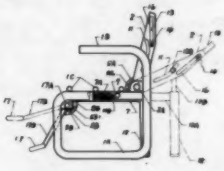
**4,389,070**

## RECLINING CHAIR WITH SUPPLEMENTAL TELESCOPING FRAME

**Wu-Shinn Chien, No. 8, Yue Tsai St., Kaohsiung, Taiwan**

**Filed Feb. 27, 1980, Ser. No. 124,967**
**Int. Cl.³ A47C *1/022***
**U.S. Cl. 297—365** **2 Claims**



1. In a reclining chair having a main frame, and a supplemental frame telescopingly supported therefrom for movement between a first position wherein said supplemental frame is disposed adjacent said main frame and a plurality of telescoped positions wherein said supplemental frame is spaced from said main frame, the main frame including foot and back portions each pivotably mounted thereon for movement between raised and lowered positions, the foot and back portions being pivotable about respective axes through a plurality of positions intermediate the raised and lowered positions, and being latchable in any of said raised, lowered or intermediate positions, the improvement comprising:

said back portion including arcuate slots disposed in opposing sides thereof;

said supplemental frame including

(1) a pair of horizontal legs telescopingly engaged with, and normally biased through tension means toward, said main frame, and

(2) a pair of vertical legs each telescopingly supporting pin means thereon for vertical movement relative to said vertical legs, each said vertical leg carrying a compression spring biasing said pin means away from said supplemental frame;

said pin means being engaged in said slots to cooperate therewith and interconnect said back portion with said supplemental frame during pivotal movement of said back portion relative to said main frame; and

means for simultaneously unlatching said foot and back

portions from any of said raised, intermediate or lowered positions.

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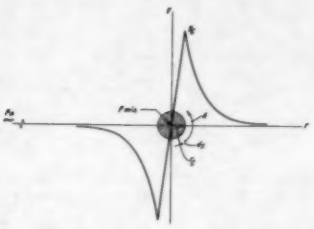
4,389,071

## ENHANCING LIQUID JET EROSION

Virgil E. Johnson, Jr., Gaithersburg, and William T. Lindenmuth, Columbia, both of Md., assignors to Hydronautics, Inc., Laurel, Md.

Filed Dec. 12, 1980, Ser. No. 215,829
Int. Cl.³ E21C 37/12
U.S. Cl. 299—14 17 Claims



1. A method of eroding a solid surface utilizing at least two high velocity liquid jets supplied with liquid from a single plenum, comprising the steps of:

(a) forming at least one cavitating liquid jet containing vapor-filled cavities formed by directing a high velocity flow of said liquid through a first nozzle that reduces the local pressure surrounding the gas nuclei in said liquid below the vapor pressure of said liquid to form vapor-filled cavities therein;

(b) surrounding said cavitating liquid jet with a liquid medium contained in a chamber, wherein the solid surface comprises a portion of the boundary of said chamber;

(c) impinging said cavitating liquid jet against the solid surface at a point where substantially the maximum number of vapor-filled cavities collapse on the solid surface to thereby cause cavitational erosion of the solid surface;

(d) forming a high velocity pulsed liquid jet within said chamber by directing a high velocity flow of said liquid through a second nozzle and oscillating the velocity of the liquid jet exiting from said second nozzle at a frequency selected to provide a Strouhal number within the range of from about 0.2 to about 1.2, based on the diameter and velocity of said cavitating liquid jet; and

(e) surrounding said pulsed liquid jet with said liquid medium contained in said chamber, said pulsed liquid jet being situated sufficiently close to said cavitating liquid jet such that the oscillation of the pulsed liquid jet within said chamber induces oscillation of the velocity of said cavitating liquid jet exiting from said first nozzle within said chamber, thereby enhancing the erosion of the solid surface by said cavitating liquid jet.

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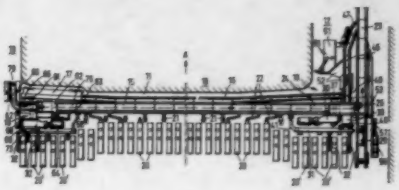
4,389,072

## LONGWALL MINERAL MINING INSTALLATION

Horst Linke; Helmut Erwien, both of Lunen; Herbert Beyer, Werne; Bodo Kerklies, Lunen; Bernhard Wieklinski, Werne; Rudolph Manusch, Bergk-Oberaden; Dieter Grundken, Lunen; Bernd Kumor, Lunen; Ulrich Mohn, all of Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,033
Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017046
Int. Cl.³ E21C 29/02
U.S. Cl. 299—32 36 Claims

1. A mineral mining installation comprising a longwall conveyor, a winning machine movable to and fro along the face side of the longwall conveyor, a drive station at one end of the longwall conveyor, the drive station including a drive frame supporting drive means for driving the longwall conveyor, a support beam at the goaf side of the drive station, the support beam extending substantially parallel to the drive frame, and a floor plate extending beneath the drive frame, wherein one



portion of the floor plate is supported on the support beam by means of a lifting device, whereby said one portion of the floor plate can be moved up and down relative to the support beam by the lifting device.

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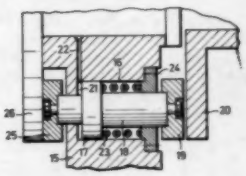
4,389,073

## APPARATUS FOR USE WITH CUTTING DRUMS OF MINERAL MACHINES

Thomas Trümper, Werne, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,135
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011583
Int. Cl.³ E21C 35/20
U.S. Cl. 299—45 9 Claims




1. Apparatus for use in selectively coupling a rotatable blade support to an associated cutting drum of a mineral mining machine to re-position the blade in relation to the drum; said apparatus comprising hydraulic piston and cylinder units rotatable with the blade support and connected to friction means drivably engageable with the drum, wherein compression springs bias the units to maintain the friction means released from the drum and the units are operable under the action of hydraulic force to oppose the biasing force of the compression springs and urge the friction means in driving engagement with the drum to couple the blade support thereto to effect repositioning of the blade.

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4,389,074

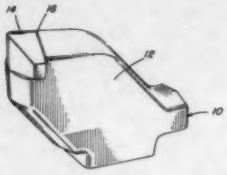
## MINE TOOLS UTILIZING COPPER-MANGANESE NICKEL BRAZING ALLOYS

Mark S. Greenfield, Henderson, Ky., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 171,578, Jul. 23, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,607
Int. Cl.³ E21B 10/00
U.S. Cl. 299—79 5 Claims

1. A mine tool comprising a ferrous metal body having a

recess and a cemented carbide insert within said recess brazed to said body by a brazing alloy consisting essentially of from about 40% to about 70% by weight of copper, from about 25% to about 45% by weight of manganese and from about 5% to about 15% by weight of nickel, wherein said brazing alloy has



a solidus temperature of from about 850° C. to about 900° C. and a liquidus temperature of less than about 930° C., said insert and said alloy filling said recess, said mine tool being designed for operation under conditions wherein the brazed joint is subjected to conditions of high shear.

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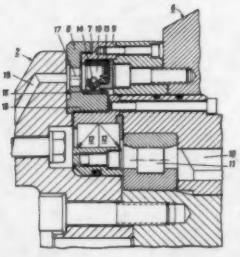
**4,389,075**

## DEVICE FOR PREVENTING INGRESS OF DUST THROUGH THE ANNULAR GAP BETWEEN THE CUTTING ARM AND THE CUTTING HEAD OF A CUTTING MACHINE

**Peter Kogler, Knittelfeld, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria**

**Filed Dec. 5, 1980, Ser. No. 213,500**
**Claims priority, application Austria, Jan. 23, 1980, 360/80**
**Int. Cl.³ E21C *35/22***
**U.S. Cl. 299—81** **7 Claims**



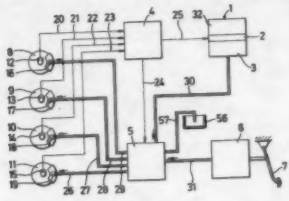
1. Device for preventing the ingress of dust through the annular gap between the cutting arm and the cutting head of a cutting machine into the interior space of the hollow cutting head within which is housed the last reduction gear stage of the cutting gear, said interior space being sealed against the annular gap by a main sealing and an additional sealing element being arranged within said annular gap outside of the main sealing, said additional sealing element being stationarily arranged on the cutting head and rotatable therewith, said device including at least one water supply conduit having a discharge nozzle carried by the cutting arm, said nozzle forming an axial or tangential jet directed against said additional sealing element.

**4,389,076**

## ARRANGEMENT FOR THE SUPPLY OF PRESSURE TO BRAKE SLIP CONTROL APPARATUS

**Fritz Ostwald, Dreieich, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.**

**Filed Apr. 17, 1981, Ser. No. 255,123**
**Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019364**
**Int. Cl.³ B60T *8/10***
**U.S. Cl. 303—92** **15 Claims**



1. An arrangement to supply pressure to a brake slip control apparatus during braking operations of automotive vehicles comprising:

a source of pressure fluid to supply necessary control pressure in wheel brake cylinders, said source of pressure fluid including

a reservoir containing a pressure fluid coupled to a control arrangement of said slip control apparatus,

a highly expansive medium disposed in said reservoir capable of acting on said pressure fluid in said reservoir, and

a device associated with a selected one of said pressure fluid and said expansive medium connected to an electronic control unit of said slip control apparatus to actuate said device at the beginning of a braking operation having locked wheels to supply said pressure fluid to said control arrangement.

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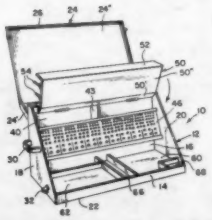
**4,389,077**

## COMPACT POSITION LOCK PARTS BIN

**LaVern Schmidt, P.O. Box 234, Montezuma, Kans. 60867**

**Continuation-in-part of Ser. No. 72,035, Sep. 4, 1979, Pat. No. 4,266,835. This application Apr. 10, 1981, Ser. No. 253,002**
**Int. Cl.³ A47B *53/00, 95/02***
**U.S. Cl. 312—244** **6 Claims**



1. A compact position lock parts bin, comprising, in combination, a case within which a plurality of parts holding compartments are formed; a cover lid connected to said case; first hinge means pivotally connecting said cover lid to said case; said case having a pair of side walls, said first hinges connecting said cover lid to said case at first ends of said pair of side walls, a low front wall connecting said side walls, a rear wall also connecting said side walls and spaced from said low front wall, said cover lid when in the closed position resting upon an edge of each of said pair of side walls; said case further comprising an inclined shelf means fixedly secured in said case and having a plurality of holes formed therethrough for storing

bolts and the like; and a cover means pivotally mounted to said case for movement between a first open position and a second closed position in which said second cover overlays said inclined shelf means to prevent the parts in said plurality of holes from falling out, said cover means having second hinge means pivotally connected to said case above said top edge surface of said inclined shelf means, and means on said cover means for preventing said cover means form moving to its first open position form its second closed position when said cover lid is in its closed, locked position, wherein said means for preventing on said cover means comprising a plurality of outwardly extending pegs, each said peg extending from the surface of said cover means facing said cover lid when both said covers are in their closed positions, at least some of said plurality of pegs abutting against said cover lid when both said covers are in their closed positions, wherein said case comprises a first parts compartment means at the top thereof and extending from the top of said rear wall, said second hinge means pivotally connected to said case being connected to said first compartment means, wherein said case further comprises a second parts compartment means directly below said first compartment means, said inclined shelf means being connected at its top edge surface thereof to the bottom of said second compartment means, said cover means closing off both said second compartment means and said shelf means when in said closed position; said second compartment means having an open front face by which said cover means closes off said second compartment means when in said closed position.

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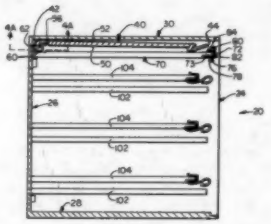
**4,389,078**

## MODULAR STORAGE UNIT

**Kenneth F. Streit, Mt. Prospect, Ill., assignor to Techplastics, Inc., West Chicago, Ill.**

**Filed Jan. 29, 1981, Ser. No. 229,650**
**Int. Cl.³ A47B *88/00*; F16B *12/00***
**U.S. Cl. 312—322** **15 Claims**



1. A storage unit comprising:

a pair of opposed side walls, a rear wall, a bottom wall, and a top wall together defining a generally box-like structure having an open front;

a movable closure panel adapted to close the front of said unit, said movable closure panel having at least two side margins, a top margin, a bottom margin, and at least an interior surface adapted to face the interior of said unit when said closure panel is positioned to close the open front of said storage unit, said panel further having two protuberances, each said protuberance extending outwardly on said interior surface and downwardly at one of the side margins of the panel to overlie a portion of the panel interior surface and define a receiving notch between the portion of the panel interior surface and a facing portion of the protuberance, said notch being closed at said panel top margin and open towards said panel bottom margin;

each of the sidewalls of said unit having a closure panel support flange projecting into the interior of the storage unit, each said flange being spaced below said storage unit top wall to define a space for receiving a side margin of said closure panel whereby said panel may be stored in a horizontal position on said flanges adjacent said top wall; each said flange terminating in a front end adjacent the front of the storage unit; and

each said panel support flange having an upwardly projecting portion on the front end whereby said closure panel may be slid along the flanges of said unit from a substantially horizontal position within said unit wherein each said receiving notch is engaged by one of said flange projecting portions to pivot said panel to a substantially vertical position closing the opening at the front of said unit.

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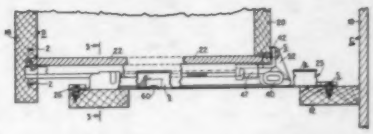
**4,389,079**

## DRAWER SLIDE ASSEMBLY

**Peter A. Cosme, R.R. 1, Box 119, Lockport, Ill. 60441**

**Filed Dec. 18, 1980, Ser. No. 217,802**
**Int. Cl.³ A47B *88/04*; F16C *29/00***
**U.S. Cl. 312—330 R** **7 Claims**



1. A drawer slide assembly for a cabinet having a cavity and a drawer slidably seated within said cavity, comprising

(a) a first channel member, comprised of a bottom web and lateral walls extending upwardly therefrom and terminating in inwardly facing flanges, said member adapted to be fixedly mounted to said cabinet,

(b) a second channel member adapted to be affixed to said drawer for nesting and sliding movement within said first channel member,

(c) a body of material having minimal frictional resistance and comprising a vertical member adapted to be affixed to the rear wall of the drawer and a horizontal member fixedly retained on the rear end of said second channel member and adjacent to said rear wall, said body including a base portion having the bottom surface thereof adapted for slidable contact with the upper surface of the web of said first channel member, and

(d) a centrally disposed sloping bridging member extending from the rearmost point of said base portion to said vertical member to facilitate the insertion of the rear end of said second channel member into the front end of said first channel member.

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**4,389,080**

## PLUG-IN CERAMIC HYBRID MODULE

**Roland E. Clark; Salvatore J. DiBartolo, both of Lynchburg, Va., and Tonny L. Johansen, Stenlose, Denmark, assignors to General Electric, Lynchburg, Va.**

**Filed Jul. 15, 1981, Ser. No. 283,462**
**Int. Cl.³ H01R *13/658***
**U.S. Cl. 339—14 R** **5 Claims**

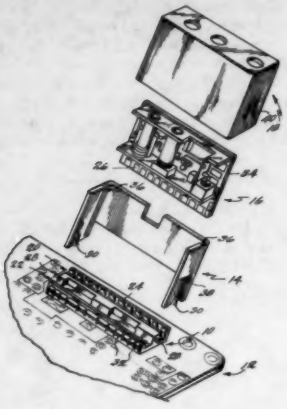
1. A hybrid circuit module for use with a printed wire board, comprising:

a circuit including a substrate and various circuit components thereon, said circuit including a plurality of contact pads formed on said substrate providing input and output connections for said circuit,

a socket, adapted for connection at a first side thereof to a printed wire board and on a second side thereof for receiving said circuit, including on said second side a plurality of metallic terminals for mechanically grasping the ceramic substrate and making electrical connection with the contact pads thereof;

a plastic retainer having a pair of grooves therein for receiv-

ing two sides of said substrate and a latch groove on a side thereof; and



a can for surrounding and shielding said circuit, having a latch therein for mating with said latch groove, said can being electrically connected with said printed wire board through said socket.

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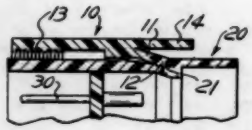
4,389,081

## ELECTRICAL CONNECTOR COUPLING RING

David O. Gallusser, Oneonta; Valentine J. Hemmer, Sidney, and Gary C. Toombs, Oneonta, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 14, 1980, Ser. No. 206,793
Int. Cl.³ H01R 13/62
U.S. Cl. 339—89 M 7 Claims




1. In combination with an electrical connector of the type having: a housing having a central axis, a forward portion, a rear portion and a groove in said rear portion; at least one electrical contact mounted in said housing; and a tubular coupling member mounted to and disposed around a portion of said housing, said coupling member having a rear portion and a forward portion adapted to connect to a similar housing having at least one contact adapted to mate with said contact in said housing, the rear portion of said coupling member having: at least one inwardly and rearwardly extending finger, each finger resiliently and radially deflectable outwardly from the central axis of said housing, each finger also having an inwardly extending shoulder located in the groove in said rear portion of said housing, the improvement wherein:

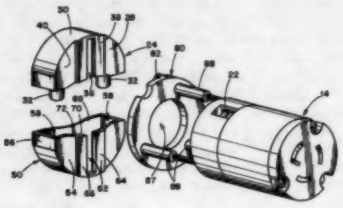
said coupling member is an integral one piece molded tubular body comprised of plastic and includes a tubular portion at the rear of the coupling member that extends over each finger whereby each finger to at least the free end thereof is protected.

4,389,082

## STRAIN RELIEF CLAMP

Bhartoor Lingaraju, Allentown, Pa., assignor to Square D Company, Palatine, Ill.

Filed Oct. 23, 1980, Ser. No. 199,770
Int. Cl.³ H01R 13/58
U.S. Cl. 339—103 R 5 Claims



1. An improved frictional locking non-rotatable strain-relief clamp for securing an electrical conductor which is attached to an electrical plug or socket and for relieving strain on the attachment of the conductor and plug or socket, said strain relief clamp comprising:

a first generally semi-circular clamp section having front and back walls and a curved side wall, said first clamp section also having a fastening post on each end of said first clamp section, each of said posts having a threaded aperture, said back wall having a narrow radially extending slot centered in said first semi-circular clamp section, first and second strengthening walls positioned on either side of said narrow radially extending slot for preventing breakage of said back wall, each of said front and back walls having a generally elliptical notch, said notch in said front wall having an engaging ridge for securing the conductor;

a second generally semi-circular clamp section having front and back walls and a curved side wall, said second clamp section also having a recess in each end of said second clamp section for receiving said posts of said first clamp section and a hole in each end of said second clamp section aligning with said threaded apertures in said first clamp section when said first and second clamp sections are assembled, said back wall having a radially extending narrow slot centered in said second semi-circular clamp section with first and second strengthening walls positioned on either side of said narrow radially extending slot for preventing breakage of said back wall, said front and back walls having a generally elliptical notch, said notch in said front wall having an engaging ridge for securing the conductor;

a pair of screws to be received by said holes in said second clamp section and to be threaded into said threaded apertures in said fastening posts of said first clamp section;

a ring shaped unitary adapter having two retaining T-shaped posts for slideably engaging said slots in said first and second clamp sections, said two retaining T-shaped posts being diametrically opposed on said unitary adapter, said T-shaped posts comprising substantially a rectangular support block with a center located aperture and a metal rivet extending through said aperture in said rectangular support block and through an aperture in said ring shaped unitary adapter, said head of said rivet being wider than said support block and being located on the opposite side of said support block from said ring shaped adapter, said unitary adapter also having an aperture for receiving the electrical conductor and means for fastening said adapter to an electrical plug or socket;

wherein the electrical conductor is first inserted through the aperture in said unitary adapter and then said first clamp section is placed on said unitary adapter with said slot in said back wall of said first clamp section being engaged by one of said retaining posts on said unitary adapter, said

second clamp section is placed on said unitary adapter with said slot in said back wall of said second clamp section engaging said other retaining post on said unitary adapter, whereby said two clamp sections are moved towards one another until the electrical conductor is clamped securely between them in the notches of said first and second clamp sections and said two clamp sections are held in place by said pair of screws.

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**4,389,083**

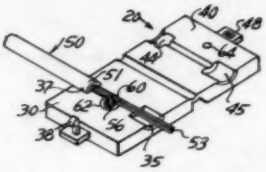
## ELECTRICAL CONNECTOR ASSEMBLY

**Richard W. Normann, Otego, and Paul D. Niles, Bainbridge, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.**

**Division of Ser. No. 137,228, Apr. 4, 1980, Pat. No. 4,342,494. This application Apr. 5, 1982, Ser. No. 365,846**

**Int. Cl.³ H01R *13/58***

**U.S. Cl. 339—105** **9 Claims**




1. In combination, a contactless electrical connector comprising:

an insulative housing including two mateable body halves having forward and rear faces with at least one of said body halves including a conductor receiving channel therein, said channel including a first recess portion extending from the rear face forwardly, a second recess extending from the forward face rearwardly and a passage connecting the two recess portions and having an intermediate portion offset from an imaginary line passing through the recesses;

a conductor including an insulative jacket surrounding plurality of conductive wires, said conductor having the insulative jacket removed from a forward end to expose the conductive wires, the exposed wires being arranged in axial alignment, said wires having a first forward end portion extending into the channel of the housing and a second rearward portion extending into the intermediate offset portion of the passage;

means for preventing axial movement of the wires in the passage; and

means for securing the housing body halves together.

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**4,389,084**

## OBSERVING APPARATUS

**Mikichi Ban, Yokohama, and Susumu Ito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 958,890, Nov. 3, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 139,768**

**Claims priority, application Japan, Nov. 9, 1977, 52-134223**

**Int. Cl.³ G02B *21/06***

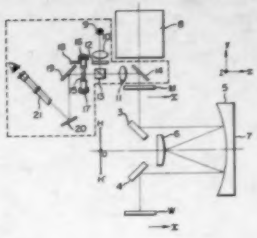
**U.S. Cl. 350—524** **4 Claims**

4. An observing apparatus comprising:

illuminating means for emitting a predetermined polarized light to illuminate a mask for manufacture of a semiconductor circuit element;

a reflective imaging optical system for focusing an arc-shaped area image of said mask onto a wafer, said reflective imaging optical system including at least one phase mirror adapted for causing the state of polarization of light passed through said mask, then reflected by said wafer and again passed through said mask to be different from the state of polarization of said predetermined polarized light;

an observing optical system for observing said mask and wafer from the side of said illuminating means with respect to said mask; and



polarizing means, located in said observing optical system for differentiating a light reflected by said wafer from said predetermined polarized light.

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**4,389,085**

## LIGHTING SYSTEM UTILIZING THE SUNLIGHT

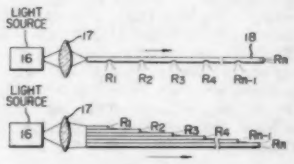
**Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan**

**Filed Dec. 16, 1981, Ser. No. 216,838**

**Claims priority, application Japan, Feb. 22, 1978, 53-19439; Mar. 9, 1978, 53-27065; May 9, 1978, 53-54122; May 30, 1978, 53-64775; Jun. 14, 1978, 53-71844; Jul. 3, 1978, 53-80630; Aug. 19, 1978, 53-101307; Oct. 16, 1978, 53-127184**

**Int. Cl.³ G02B *5/172***

**U.S. Cl. 350—96.10** **10 Claims**




1. A solar lighting system, comprising:

at least one optical fiber light distribution means comprising (i) an optically transparent core having a lateral surface, a light receiving end and another end remote therefrom, and having a refractive index such that the light is reflected toward the surface thereof at predetermined points, (ii) an optical cladding layer substantially surrounding said core for cooperating with said core to confine light being transmitted through said fiber, to said core, and (iii) a plurality of light diffusion holes disposed at said predetermined points in said cladding intermediate said ends for permitting light to escape from said core, each of said holes being filled with a transparent optical medium having a larger refractive index than that of said core; and

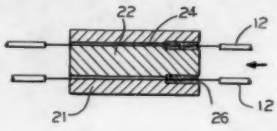
optical lens means for coupling sunlight into the light receiving end of said light distribution means.

4,389,086

## FEEDTHROUGH TERMINAL COMPRISING A GUIDE MEMBER DEFINED FOR AT LEAST ONE OPTICAL FIBER CABLE BETWEEN A TUBE AND A ROD

Kahei Furusawa; Yoshihiro Ejiri; Yoshihiko Yamazaki; Tadayoshi Matsuzaki; Hiroyuki Nakashima, and Osamu Harada, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd. and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed May 8, 1981, Ser. No. 261,910
Claims priority, application Japan, May 12, 1980, 55-62644
Int. Cl.³ G02B 5/14; H01L 33/00
U.S. Cl. 350—96.20 8 Claims




1. A feedthrough terminal for tightly supporting at least one optical fiber cable having a predetermined optical characteristic therethrough, said feedthrough terminal comprising:

a tube of a first metal having an inside cylindrical surface defining a cylindrical hollow space, said first metal having a first thermal expansion coefficient;

a rod of a second metal having an outside cylindrical surface and received snugly in said cylindrical hollow space with an interface provided by said inside and said outside cylindrical surfaces, said second metal having a second thermal expansion coefficient less than said first thermal expansion coefficient;

guide means for guiding said optical fiber cable along said interface with a gap left around at least a portion of the optical fiber cable guided by said guide means; and

a mass of solder filling said gap for fixing said tube with said rod, said solder having a third thermal expansion coefficient selected in consideration of said first thermal expansion coefficient and a fusion temperature such as not to substantially affect said predetermined optical characteristic.

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4,389,087

## MECHANICAL PROTECTION AND REINFORCEMENT FOR OPTICAL FIBERS

Jacques Bendayan, and Robert Jocteur, both of Lyons, France, assignors to Les Cables de Lyon S.A., Lyons, France

Continuation of Ser. No. 876,831, Feb. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 718,200, Aug. 26, 1976, abandoned. This application Sep. 21, 1979, Ser. No. 77,496
Claims priority, application France, Sep. 19, 1975, 75 28808
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 3 Claims

1. A reinforced optical fiber comprising: a bare optical fiber; an inner protective covering of an extrudable material of a high modulus of elasticity and in contact with said optical fiber over its whole circumference; an outer protective covering of an extrudable material of a low modulus of elasticity and concentric and in contact with said inner covering along a borderline between said inner and outer coverings over most of its circumference; at least one reinforcing supporting longitudinal cord being embedded within said outer covering and in contact with said inner covering along a portion of said borderline between said inner covering and said outer covering, said inner and outer coverings being optically inactive with respect to said optical fiber.

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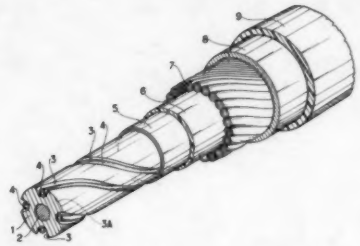
4,389,088

## UNDERWATER OPTICAL FIBRE CABLE

Jean-Pierre Trezequet, Calais, France, assignor to Les Cables de Lyon, Lyons, France

Filed Jun. 27, 1980, Ser. No. 163,659
Claims priority, application France, Jun. 28, 1979, 79 16717
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.23 6 Claims




2. An underwater optical fibre cable including a central filament provided with helical grooves for receiving at least one optical fibre in each groove, the improvement wherein the groove cross-section is such that an optical fibre therein can move transversally by at least half of its transversal dimension, said central filament being made of a metal or a metal alloy, and wherein said central filament is covered successively by a first metal tube, an insulating covering, a layer of metal wires wound helically in contiguous turns, a second metal tube and a second insulating covering.

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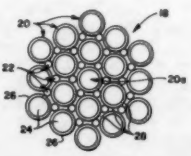
4,389,089

## FLEXIBLE FIBER OPTICAL CONDUIT AND METHOD OF MAKING

Richard R. Strack, Sturbridge, Mass., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Jul. 14, 1980, Ser. No. 168,856
Int. Cl.³ G02B 5/17; C03B 23/20, 37/01
U.S. Cl. 350—96.26 8 Claims




1. The method of making flexible image-conducting fiber conduit comprising:

constructing a fiber bundle preform by juxtapositioning a plurality of glass-clad glass optical elements and interstitial rods of leachable material, the rods serving to space said elements from each other;

heating and drawing said preform into a section of approxi-

mately the cross-sectional size desired of said conduit, said rods providing an interstitial matrix;
cutting from said drawn section a length corresponding to the length desired of said conduit;
covering opposite ends of said cut length of said drawn section; and
subjecting remaining uncovered portions of said length of drawn section to a leaching medium for a time sufficient to remove said interstitial matrix.

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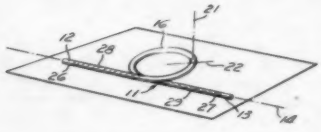
**4,389,090**

## FIBER OPTIC POLARIZATION CONTROLLER

**Herve C. LeFevre, Los Altos, Calif., assignor to The Board of Trustees of Leland Stanford Jr. Univ., Stanford, Calif.**

**Filed Sep. 4, 1980, Ser. No. 183,975**
**Int. Cl.³ G02B 5/172**
**U.S. Cl. 350—96.29** **10 Claims**




1. In a fiber optic device for controlling the state of polarization of light passing therethrough: a strand of fiber optic material having end portions and a central portion between said end portions, said central portion being bent into a generally planar coil to stress the fiber optic material to provide a birefringent medium, the end portions of the strand extending tangentially from the coil, each of the end portions being affixed in a stationary position at a predetermined point, the plane of the coil being rotated about the end portions to twist the end portions between the coil and the fixed points and to effect a change in the polarization of the light passing between the end portions of the strand.

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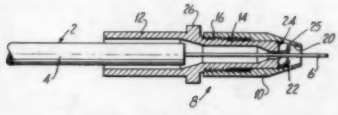
**4,389,091**

## METHOD AND DEVICE FOR CONNECTING OPTICAL FIBERS

**Rune Lidholt, Skogsmyrsvägen 4A, 752 45 Upsala, and Ingvar Nodfelt, Hornabogatan 2, 330 30 Gnosjö, both of Sweden**

**Filed Feb. 11, 1980, Ser. No. 120,349**
**Claims priority, application Sweden, Feb. 16, 1979, 7901398**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.20** **10 Claims**




6. In a device for connecting the end portion of an optical fiber with another optical component, including a sleeve element for receiving and fixing the end portion of the optical fiber thereto, and a coupling device for receiving the sleeve element with the fiber end portion fixed therein and the other optical component with the optical fiber and the other optical component in position for optical connection with each other, wherein the sleeve element is provided with an inner surface portion which tapers toward said fiber end portion in the axial direction of the sleeve element and at least three centering elements contacting said surface portion, the centering elements constituting between themselves a central passage for clamping the fiber end portion, the improvement comprising means integral with said sleeve element for axially displacing the tapering surface portion in relation to the centering elements to displace the centering elements into clamping engagement with the surface of the fiber end portion, an outer reference surface on said sleeve element which has an exactly predetermined uniform geometric relation to said tapering surface portion of the sleeve element, so that the position of said reference surface is exactly predetermined in relation to the fiber end portion after the fiber end portion has been clamped by the centering elements, and a guiding surface on said coupling device conforming to said outer reference surface and adapted to be engaged by said reference surface when the sleeve element is received in the coupling device disposed in predetermined position in the coupling device so that said engagement between said guiding surface and said reference surface positions the end surface of the fiber end portion in correct position in relation to the other optical component.

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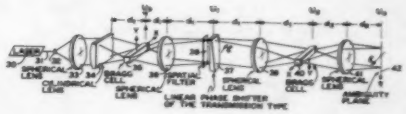
**4,389,092**

## HIGH SPEED AMBIGUITY FUNCTION EVALUATION BY OPTICAL PROCESSING UTILIZING A SPACE VARIANT LINEAR PHASE SHIFTER

**Poohsan N. Tamura, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 29, 1980, Ser. No. 173,319**
**Int. Cl.³ G06G 9/00; G01S 13/58**
**U.S. Cl. 350—162.12** **9 Claims**




1. An optical system utilizing a beam of substantially coherent light to create the ambiguity function arising from a first signal and a second signal, said system comprising:
a first data input means for coding said light beam with said first signal;
a first Fourier Transform lens lying in the path of the coded light beam and a Fourier Transform Plane associated therewith;
a linear phase shifter lying in the path of said coded light beam in said Fourier Transform plane;
a second data input means for coding the phase shifted light beam with said second signal; and
a final Fourier Transform lens means lying in the path of said light beam for producing the ambiguity function at an ambiguity plane.

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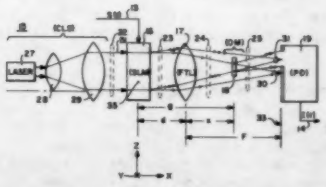
**4,389,093**

## METHOD AND APPARATUS FOR COHERENT DETECTION IN OPTICAL PROCESSORS

**David W. Jackson, San Jose, Calif., assignor to Probe Systems, Inc., Sunnyvale, Calif.**

**Filed Mar. 23, 1981, Ser. No. 246,286**
**Int. Cl.³ G06G 9/00; G02B 5/32**
**U.S. Cl. 350—162.14** **26 Claims**




1. An optical processor apparatus comprising:
a light source for providing a coherent source beam,

a spatial light modulator for modulating the source beam with an input information signal to produce a modulated beam, said modulated beam diverging into spacially separated frequency components including a zero frequency component from said source beam,

reference beam generator means for forming a reference beam from said zero frequency component such that said reference beam appears to diverge from a reference point,

an optical detector having an aperture positioned for receiving said reference bean and particular ones of said spatially separated frequency components whereby said particular ones of said spatially separated frequency components are coherently detected to produce an output information signal as a function of the input information signal.

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**4,389,094**

## PROCESS FOR CASTING ON A SUPPORT THE FAITHFULL REPRODUCTION OF A MASK PIERCED WITH PERIODICALLY DISTRIBUTED SLITS

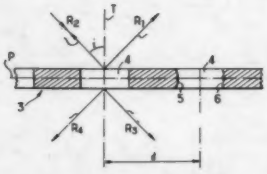
**Jean-Louis A. Roumiguieres, 69 boulevard Desgranges, 92330 Sceaux, France, and Michel J. Neviere, Marseilles, France, assignors to Jean-Louis A. Roumiguieres, Sceaux, France**

**Filed Sep. 5, 1980, Ser. No. 184,265**

**Claims priority, application France, Sep. 10, 1979, 79 22554**

**Int. Cl.³ G02B *5/18***

**U.S. Cl. 350—162.17** **3 Claims**




1. A process for obtaining a cast shadow reproduction of a mask on a support wherein the mask is pierced with fine periodically distributed parallel slits, comprising the steps of:

illuminating said mask with a plane monochromatic wave which is polarized perpendicular to its plane of incidence so that the electric field vector is parallel to said slits;

choosing the wavelength of said plane incident wave so that there exist only two diffracted orders, one for each one of two half-spaces which are situated on each side of the mean plane of the mask; and

adjusting the angle of incidence of said plane wave so that the −1 reflected order is propagated in the direction opposite to the direction of the incident wave.

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**4,389,095**

## MULTI-COLORED LIQUID CRYSTAL DISPLAY DEVICE WITH CHARACTERS NOT DISPLAYING SHIFTS IN POSITIONS EVEN UPON COLOR CHANGES

**Toru Teshima, Yokohama; Kazuo Ariga, Tokyo, and Takao Kasahara, Sagamihara, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 134,121, Mar. 26, 1980, abandoned. This application Oct. 10, 1980, Ser. No. 195,868**

**Claims priority, application Japan, Apr. 6, 1979, 54-41573**

**Int. Cl.³ G02F *1/13***

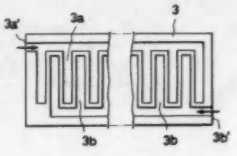
**U.S. Cl. 350—334** **5 Claims**

1. A multi-colored liquid crystal display device having a viewing surface comprising:

at least one display section exhibiting a given display pattern, said at least one display section including a plurality of closely adjacent display segments, the spacing between adjacent display segments being from about 0.5 to about 0.1 mm and each display segment having a width of from about 0.05 to about 0.1 mm, each of said display segments exhibiting substantially the same said given display pattern and each said display segment including means for receiving liquid crystals therein;

said display segments of said at least one display section being adjacent each other in a direction substantially along said viewing surface and being so closely adjacent each other that, to a viewer, they appear to be in substantially the same position on said display device;

liquid crystals of respective different absorption spectra sealed in adjacent display segments of said at least one display section, each display segment of said at least one




display section containing liquid crystals of a different absorption spectrum such that said adjacent display segments provide respective different color displays when energized; and

a source of electrical power coupled to said display segments for selectively energizing respective display segments of said at least one display section to selectively produce a display of said given display pattern in different colors without substantially changing the apparent position of said given display pattern with respect to a viewer.

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**4,389,096**

## IMAGE DISPLAY APPARATUS OF LIQUID CRYSTAL VALVE PROJECTION TYPE

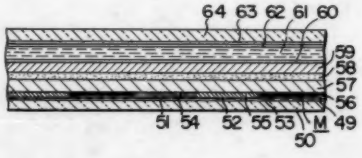
**Yoshikazu Hori; Komei Asai, both of Hirakata, and Masakazu Fukai, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 561, Dec. 26, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,471**

**Claims priority, application Japan, Dec. 27, 1977, 52/157632; Dec. 27, 1977, 52/157633; Dec. 27, 1977, 52/157634; Dec. 27, 1977, 52/157635; Feb. 21, 1978, 53/19430; Apr. 20, 1978, 53/47341**

**Int. Cl.³ G02F *1/13***

**U.S. Cl. 350—339 R** **16 Claims**




1. A liquid crystal light valve projection color image display apparatus comprising:

an electro-optic element comprising a pair of substrates; a nematic liquid crystal layer interposed between said substrates and having optic anisotropy; electric field applying means for applying to said nematic liquid crystal layer a patterned electric field which has a plurality of different striped electric field patterns each associated with a respective different region of said liquid crystal layer to form a plurality of different diffraction gratings, each having a different diffraction pattern; in said regions of said liquid crystal layer, each of said different diffraction gratings having a respective fixed spatial diffraction period; means for forming from at least one applied image signal a plurality of color separated input image signals in

said electro-optic element each said color separated image signal being formed in a different region of said electro-optic element containing a respective diffraction grating, said electro-optic element forming a plurality of separate diffracted color images from said applied input image by means of said plurality of different diffraction gratings;

means for applying at least one input image signal to said electro-optic element; and,

a Schlieren optical system for projecting said separate color images formed in said electro-optic element onto a projection surface.

16. A liquid crystal light valve projection image display apparatus comprising:

an electro-optic element including a pair of substrates, a nematic liquid crystal layer and a photoconductive layer arranged in series and interposed between said substrates, said nematic liquid crystal layer having a dielectric and optic anisotropy, a light blocking mask having striped openings at a fixed spatial period disposed on an input light side of said photoconductive layer, a first means including said mask and photoconductive layer for supplying a first electric field in a two-dimensional voltage pattern having a fixed striped spatial period to said liquid crystal layer to produce first areas of said layer where the molecules thereof are reoriented away from a predetermined molecular orientation by a voltage potential of said electric field and second areas of said layer not exposed to a voltage potential of said electric field where said molecules continue to have said predetermined molecular orientation, thus forming a phase diffraction grating in said liquid crystal layer, and second means for supplying said liquid crystal layer with a second electric field having a spatially distributed intensity corresponding to an electrical or optical input image signal representing a two-dimensional image;

image supply means for electrically or optically supplying said input image signal to said electro-optic element; and,

a Schlieren optical system for projecting image information formed in said liquid crystal layer as said phase diffraction grating on a screen by using light diffracted from said phase diffraction grating.

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**4,389,097**

## OCULAR OPTICAL SYSTEM

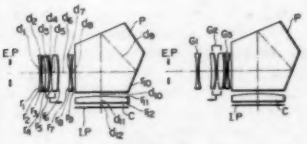
**Michiro Ohishi, Hatoyama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 9, 1980, Ser. No. 214,899**

**Claims priority, application Japan, Dec. 26, 1979, 54-169659**

**Int. Cl.³ G02B *25/04***

**U.S. Cl. 350—410** **6 Claims**



1. An ocular optical system having a wide diopter adjustment range comprising, in order from the viewing side, a first lens component having a negative refracting power, a second lens component having a positive refracting power, a third lens component having a negative refracting power, a pentaprism, and a condenser lens component, wherein the second lens having the positive refracting power is movable for diopter adjustment, said optical system satisfying the following conditions:

$$F_1<0,\ 0.7F<|F_1|<F, \tag{1}$$

$$0.35F<F_{1,2}<0.55F, \text{ and} \tag{2}$$

$$1.4<(\nu_2+\nu_3)/(\nu_1+\nu_4)<1.8, \tag{3}$$

where F is the overall focal length of the optical system, $F_{1,2}$ ... $_i$ is the resultant focal length up to the i-th lens group, and $\nu_i$ is the Abbe number of the i-th lens from the viewing side.

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**4,389,098**

## ZOOM LENS BARREL

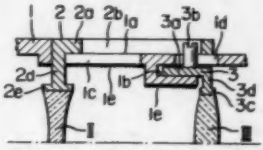
**Syousuke Fukushima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 26, 1980, Ser. No. 181,615**

**Claims priority, application Japan, Aug. 29, 1979, 54-117961[U]**

**Int. Cl.³ G02B *7/10***

**U.S. Cl. 350—429** **4 Claims**



1. In a zoom lens having at least two movable lenses, the combination of a fixed barrel having at least two outwardly positioned smooth supporting surfaces, means forming an optically axial linear slot and a first cam slot oblique to the optical axis in one of said surfaces, an operating member having a second cam slot therein slidably mounted in said linear slot on one of said smooth supporting surfaces, a first lens system supported from said operating member, a driven member slidably supported on one of said smooth supporting surfaces, a second lens system supported from said driven member, and pin means mounted on said driven member and extending vertically therefrom into said first and second cam slots, whereby movement of said operating member in said linear slot causes sliding movement of said operating member and said driven member on the said outer surfaces of said barrel and axial movement of said two lens system relatively to one another.

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**4,389,099**

## PHOTOGRAPHIC LENS SYSTEM

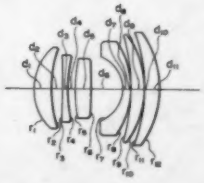
**Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jul. 15, 1981, Ser. No. 283,459**

**Claims priority, application Japan, Jul. 17, 1980, 55-97781**

**Int. Cl.³ G02B *9/62***

**U.S. Cl. 350—464** **5 Claims**



1. A photographic lens system comprising: a front lens group consisting of a first lens component of a positive meniscus lens with its convex surface on the object side, a second lens component of a biconcave lens and a third lens component of a biconvex lens; and a rear lens group consisting of a fourth lens

component of a negative meniscus lens with its convex surface on the object side, a fifth lens component of a positive meniscus lens with its convex surface on the image side and a sixth lens component of a positive meniscus lens with its convex surface on the image side, said lens system satisfying the following conditions:

$$1.2<f/f_{123}<1.8 \quad (1)$$

$$-1.3<f/f_{456}<-0.3 \quad (2)$$

$$0.16<d_6/f<0.175 \quad (3)$$

wherein the reference symbol f represents the focal length of the entire lens system, the symbol $f_{123}$ represents the focal length of the front lens group, the symbol $f_{456}$ represents the focal length of the rear lens group, and the symbol $d_6$ represents the axial air space between the front and rear lens groups, respectively.

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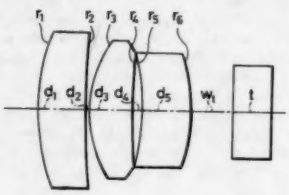
**4,389,100**

## OBJECTIVE SYSTEM FOR VIDEO DISC

**Takahiro Sugiyama, and Yukio Hagiwara, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 17, 1982, Ser. No. 358,778**
**Claims priority, application Japan, Mar. 18, 1981, 56-38845**
**Int. Cl.³ G02B 9/12, 21/02**
**U.S. Cl. 350—478** **3 Claims**




1. An objective system for a video disc, comprising: a first lens component including a positive meniscus lens convex to the light source, a second lens component including a positive meniscus lens convex to the light source, a third lens component including a positive meniscus lens concave to the light source and having a relatively long focal length, and a cover glass for said video disc, said objective system satisfying the following conditions:

$$F/0.55<F_1<F/0.25 \quad (1)$$

$$F/1.0<F_2<F/0.5 \quad (2)$$

$$F_3>F/0.15 \quad (3)$$

$$F<|r_3|<3F,\ r_5<0 \quad (4)$$

$$d_2<0.2F \quad (5)$$

$$d_4<0.3F \quad (6)$$

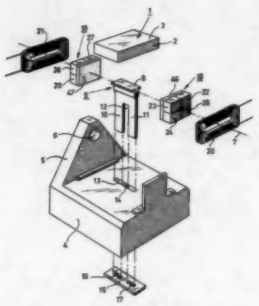
where F is the resultant focal length of the overall lens system, $F_i$ is the focal length of the i-th lens component, $r_i$ is the radius of curvature of the i-th surface, $d_i$ is the thickness or air gap of the i-th lens, and $N_i$ is the refractive index of the i-th lens.

**4,389,101**

## DEVICE FOR PIVOTING AN OPTICAL ELEMENT UNDER ELECTRO-DYNAMIC CONTROL

**Gerard E. van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 2, 1981, Ser. No. 239,880**
**Claims priority, application Netherlands, Mar. 19, 1980, 8001617**
**Int. Cl.³ G02B 27/17**
**U.S. Cl. 350—486** **3 Claims**



1. A device for pivoting an optical element, such as a pivoting mirror (1) for an optical video disc player, under electrodynamic control, which device comprises:

a frame (4),

an optical element (1) which is supported by the frame so as to pivotable about a pivoting axis (7),

a pivotal bearing arrangement for pivotably supporting the optical element (1) on the frame (4) and comprising pivotable bearing means (8) connected to the optical element and stationary bearing means (9) connected to the frame,

permanent magnetic means (22–25; 26–29), connected to the optical element, on at least one side of the optical element, and

control-coil means (20; 21), connected to the frame, for generating an electromagnetic control field and thereby exerting a pivoting moment on the permanent magnetic means, characterized in that

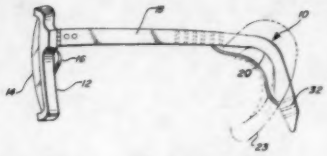
the permanent magnetic means (22–25; 26–29) are situated on at least one of the axial sides of the optical element (1), that, on each axial side where permanent magnetic means are situated, said means comprise two zones of north polarity (N) and two zones of south polarity (S), that said magnetic zones are situated in a plane perpendicular to the pivoting axis (7), that the North zones (N) are situated diametrically opposite each other at equal distances from the pivoting axis (7) and the south zones (S) are also situated diametrically opposite each other at equal distances from the pivoting axis (7), that the control coil means comprise a control coil (20; 21) having turns (35; 30) with parallel sides (31–34; 36–39) which extend over a permanent magnetic zone and having portions (40–42; 43–45) connecting said parallel sides, which portions are situated outside the magnetic zones, that the pivoting axis (7) extends through the centre of the control coil, and that relative to the permanent magnetic means (22–25; 26–29) the control coil (20; 21) is oriented in such a way that each of the said parallel sides (31–34; 36–39) of each winding (35; 30) is parallel to an imaginary connecting line between a zone of north polarity (N) and a zone of south polarity (S).

**4,389,102**

## EYEGLASS TEMPLE BAR RETAINING MEANS

**Carl P. Piampiano, 262 Seminole Rd., Atlantic Beach, Fla. 32233**

**Filed Nov. 17, 1980, Ser. No. 207,384**
**Int. Cl.³ G02C 5/14, 1/00, 3/00**
**U.S. Cl. 351—123** **11 Claims**



**1.** In an articulated eyeglass frame provided with lens windows from which there project rearwardly a pair of substantially horizontal temple bars having downardly extending curved ear hooks at their distal ends, the improvement comprising: at least one elastic cord connected at one of its ends to the juncture region between each temple bar and its curved ear hook and at its other end to the lower end of the ear hook and extending in chordal fashion across the hook to partially wrap itself at the back of a user's ear so as to yieldingly urge the temple bars rearwardly on the head of the user.

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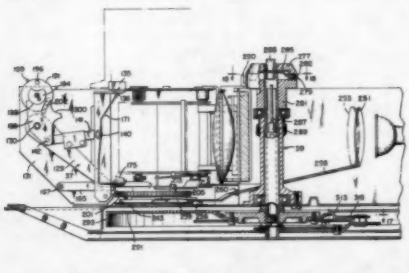
**4,389,103**

## SLIDE PROJECTOR HAVING TWO IMAGE-PROJECTION SYSTEMS WHICH OPERATE WITH A SINGLE SLIDE TRAY

**Gideon A. Kramer, Seattle, Wash., assignor to Source Technology Corporation, Mukilteo, Wash.**

**Filed Jul. 24, 1981, Ser. No. 286,520**
**Int. Cl.³ G03B 23/08, 23/12**
**U.S. Cl. 353—25** **6 Claims**



**1.** In a slide projector which includes a single circular slide tray having a central opening therein, an apparatus for driving the slide tray, comprising:

a central hub means, on which the slide tray may be positioned;

means locking the slide tray to said central hub in a known relationship thereto;

drive disc means secured to said central hub;

powered means for rotating said drive disc, and hence said central hub;

means for sensing the amount of rotational movement of said central hub; and

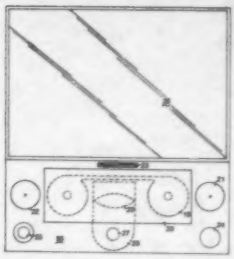
means for initially aligning a reference point of said central hub with a reference indicia of said sensing means, so that the initial position of the slide tray is known and so that thereafter the position of the slide tray may be ascertained from the amount of rotational movement of said central hub.

**4,389,104**

## MICROFILM CASSETTE AND THE PROJECTION APPARATUS FOR THE VIEWING OF SAME

**Dominique Aussell, 16, Allee de la Teurtais, 35300 Fougeres, France**

**Filed Oct. 16, 1980, Ser. No. 197,574**
**Int. Cl.³ G03B 21/11, 21/28, 23/02**
**U.S. Cl. 353—26 R** **9 Claims**



**1.** A microfilm device comprising a cassette having an integral pair of cylindrical chambers joined in separated positions by closely spaced parallel flat surfaces for holding a film in an optical plane of a format area, whereby film may be transported from either chamber between the flat surfaces and through the format area to the other chamber, a chassis having an optical system with an optical axis for projecting an image which is in said optical plane in said format area, cradle means mounted on said chassis and configured with complementary contours for matingly and slidingly receiving said joined chambers in order to support said cassette with a transverse sliding movement of said cassette to an operating position within the cradle means at locations relative to said chassis in order to position said format area in an optical path, shafts associated with said cylindrical chambers for winding and transporting said film in either direction between said chambers while the cassette is in said cradle means, and means for transmitting driving forces to said shafts.

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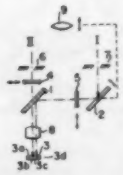
**4,389,105**

## DEVICE FOR DETECTING COINCIDENT FOCUSING POINTS

**Kiyoshi Kitai; Takeo Saito; Takashi Segawa, and Yoichi Seki, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 17, 1978, Ser. No. 961,742**
**Claims priority, application Japan, Nov. 18, 1977, 52-138740**
**Int. Cl.³ G03B 3/10**
**U.S. Cl. 354—25** **7 Claims**



**1.** Device for detecting coincident focusing points of two different light paths, comprising: a plurality of light receiving elements forming a single array for receiving light incoming from the two different light paths to produce sets of signals $A_1 \ldots A_n$ and $B_1 \ldots B_n$, means for cutting off the first light path so that the incoming light of the second light path is received

by said light receiving elements, means for forming the ratio between the output signals $A_1 \ldots A_n$ of each of the elements with respect to another of signals $A_1 \ldots A_n$ and for storing same, means for thereafter applying the incoming light in said first light path and said second light path simultaneously or the incoming light in the first light path to said light receiving elements, means for forming the ratio between the output signals $B_1, \ldots B_n$ of each of the elements with respect to another of signals $B_1 \ldots B_n$, means for comparing the ratios with the stored ratios and for producing a signal when the ratio between the similar elements are coincident with each other.

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**4,389,106**

**FOCUSING CONTROL DEVICE**

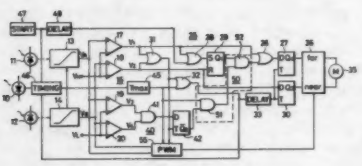
**Takashi Maruyama, Suwa, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan**

**Filed Jul. 10, 1981, Ser. No. 282,027**

**Claims priority, application Japan, Aug. 6, 1980, 55-107900**

**Int. Cl.³ G03B *3/10***

**U.S. Cl. 354—25** **4 Claims**



1. In a lens focusing device of the type having first and second range finding elements for generating first and second signals, first and second integrator circuits respectively receiving said first and second signals and providing outputs relative to one another according to the state of focus, the output of said first integrator circuit being larger than the output of said second integrator circuit in the case of a front focusing condition and the output of said second integrator circuit being larger than the output of said first integrator circuit in the case of a rear focusing condition, and a direction discriminating and storing means responsive to the outputs of said first and second integrator circuits for determining the direction of movement of a lens, the improvement comprising the combination of

focusing tolerance range discriminating and storing means responsive to the outputs of said first and second integrator circuits for determining whether or not focusing of said lens is within a focusing tolerance range,

timing means for starting a clocking operation when the integration of said first and second integration circuits is started and stopping said clocking operation when the output of one of said first or second integration circuits reaches a predetermined threshold value, and

infinity focus discriminating means responsive to said direction discriminating and storing means, said focusing tolerance range discriminating and storing means and said timing means for causing said lens to move to the infinity focus position when said clocking operation has clocked a predetermined longest integration time only under the conditions that said focusing tolerance range discriminating and storing means stores the fact that focusing of said lens is out of a focusing tolerance range and said direction discriminating and storing means stores the fact that said lens is in a front focusing condition.

**4,389,107**

**FOCUSING DEVICE FOR CAMERAS**

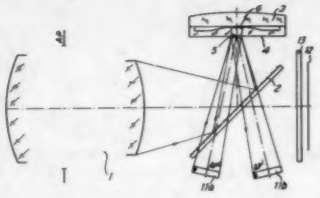
**Michael Lenk, Pirna, and Gottfried König, Dresden, both of German Democratic Rep., assignors to Veb Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.**

**Filed May 15, 1981, Ser. No. 264,159**

**Claims priority, application German Democratic Rep., May 16, 1980, 221144**

**Int. Cl.³ G03B *7/08***

**U.S. Cl. 354—25** **1 Claim**



1. In a monocular reflex camera comprising a housing, an objective mounted on said housing, a film support plane disposed on the optical axis of the objective, and a shutter between said objective and film support plane and closely adjacent the latter, the provision of a partially light transmitting reflex mirror between said objective and said shutter and inclined to said optical axis of 45° thereto, a composite image field lens of which one portion at the light input side thereof has a convex rear surface, positioned on one side of the mirror to receive the reflected image of the object for the purpose of viewing, a pair of photoelectric cells disposed within the housing and positioned on the other side of said reflex mirror, a pair of image dividing wedges provided centrally of the image field lens at the input side thereof at a distance from said reflex mirror at the optical axis equal to the distance from said reflex mirror at the optical axis to said film support plane, said wedges extending over a mirror central portion of said image field lens, and a concave mirror formed on said convex rear surface of the first part of said image field lens and extending over an area of substantially the same size as the area covered by said wedges, said concave mirror serving to reflect the two images from the wedges back through the wedges to the photoelectric cells which provide an electrical output indicative of the sharpness of focus.

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**4,389,108**

**POWER SUPPLY CONTROL CIRCUIT IN A CAMERA**

**Yoshiaki Ohtsubo, Kawasaki; Sakuji Watanabe, Warabi, and Ryuzo Motoori, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Continuation of Ser. No. 268,684, Jun. 1, 1981, abandoned, which is a continuation of Ser. No. 73,422, Sep. 7, 1979, abandoned. This application Mar. 17, 1982, Ser. No. 359,031**

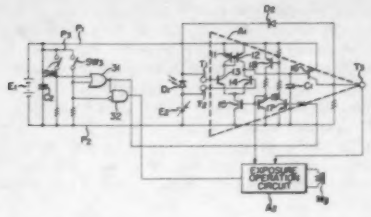
**Claims priority, application Japan, Sep. 14, 1978, 53/113015**

**Int. Cl.³ G03B *7/083***

**U.S. Cl. 354—50** **2 Claims**

1. In a camera having a light metering circuit including a light receiving element for receiving light from the object to be photographed and a circuit for amplifying output from the light receiving element, said amplifying circuit including a differential amplifier and capacitor means for preventing oscillation of said differential amplifier; means for controlling exposure based on the output from the metering circuit; first switch means actuated at a first step of a shutter release operation to permit power to flow from a source to the metering circuit; and second switch means actuated at a second step of the shutter release operation following said first step to trigger said exposure control means; the improvement wherein said amplifying circuit further comprises:

means for connecting said capacitor means across said source; and




third switch means operatively associated with said first switch means for controlling operation of said differential amplifier.

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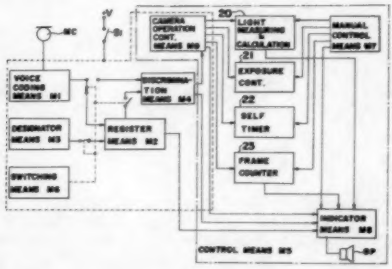
**4,389,109**

## CAMERA WITH A VOICE COMMAND RESPONSIVE SYSTEM

**Nobuyuki Taniguchi, Sakai; Masaaki Nakai, Nara; Tokuji Ishida, Daito, and Isamu Uchida, Kawachinagano, all of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan**

**Filed Dec. 29, 1980, Ser. No. 220,777**
**Claims priority, application Japan, Dec. 31, 1979, 54-171491**
**Int. Cl.³ G03B *17/18, 17/40;* G10L *1/00***
**U.S. Cl. 354—60 L** **50 Claims**




1. A control system for a camera which performs a plurality of operations, said system comprising:

switching means for selectively bringing the control system to one of a learning mode and a working mode;

voice coding means for coding a voice command to a recognizable pattern and for producing a voice feature signal;

register means having a plurality of sections each being capable of registering one voice feature signal during said learning mode such that a plurality of voice feature signals corresponding to said plurality of camera operations are registered in said register means;

designator means operable during said learning mode for designating said plurality of sections of said register means for registering said plurality of voice feature signals to respective designated sections;

discriminator means operable during said working mode for discriminating one of said plurality of sections carrying a voice feature signal which correlates with a newly obtained voice feature signal;

control means for controlling the camera such that the camera performs one of the operations commensurate with the section discriminated by the discriminator means, and

means for producing an exposure data signal and an exposure data indication means, wherein said control means further includes means for reading out an exposure data signal from said exposure data signal producing means corresponding to the discriminated section of said register means and means for actuating said exposure data indication means to indicate an exposure datum commensurate with the read-out exposure data signal.

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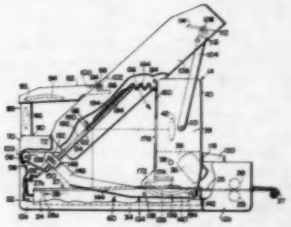
**4,389,110**

## FOLDING CAMERA

**Donato F. Pizzuti, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 28, 1981, Ser. No. 334,979**
**Int. Cl.³ G03B *17/04, 15/03***
**U.S. Cl. 354—126** **29 Claims**



1. A folding camera comprising:

a first housing section including means for supporting a film unit at a film plane located within said first housing section;

a second housing section mounting an objective lens, said second housing section being pivotally coupled to said first housing section, adjacent one end of said film plane, for movement between an upstanding operative erected position wherein the optic axis of the lens is set at a predetermined non-perpendicular angle with respect to said film plane and a folded inoperative storage position wherein said second housing section is folded back over said first housing section so that at least a portion of said second housing section overlies said film plane;

a mirror assembly including a mirror and means for pivotally coupling said mirror to said first housing section, adjacent the end of said film plane opposite said one end thereof, for movement between an operative erected position wherein a reflective surface of said mirror is set at a predetermined angle with respect to said film plane and said optic axis when said second housing section is at said erected position for reflecting image forming light rays transmitted by said lens onto said film plane to expose a film unit thereat and an inoperative folded storage position wherein at least a portion of said mirror overlies at least a portion of said film plane and is located between said film plane and at least a portion of said second housing section located at its said storage position; and

means for interconnecting said mirror assembly and said second housing section for coordinated movement in response to movement of said second housing section from its said storage position toward its said erected position for effecting movement of said mirror assembly from its said storage position to its said erected position and also responsive to movement of said second housing section from its erected position toward its said storage position for effecting movement of said mirror assembly from its said erected position to its said storage position.

**4,389,111**

## CAMERA

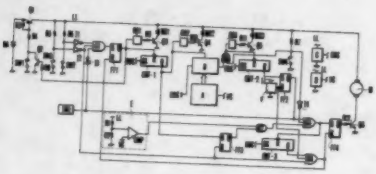
**Masanori Uchidoi, Yokohama; Yoshihiro Shigeta, Tokyo; Ryoichi Yoshikawa, Yokohama; Yoichi Tosaka, Shakuji, and Shosuke Haraguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 24, 1981, Ser. No. 295,361**

**Claims priority, application Japan, Aug. 28, 1980, 55-118621[U]**

**Int. Cl.³ G03B *1/18***

**U.S. Cl. 354—173** **7 Claims**



3. A camera comprising:

(a) shutter means including a shutter for opening and closing a shutter opening;

(b) shutter release means for opening the shutter;

(c) a shutter timer circit for counting a shutter time and producing a signal when the shutter time lapses;

(d) electromagnetic means for closing the shutter means in response to the signal from the shutter time circuit;

(e) shutter detecting means for detecting if said shutter means has performed a closing operation;

(f) a motor for charging said shutter means in response to the detection by said shutter detection means that said shutter means has performed the closing operation; and

(g) voltage detecting means for detecting a voltage of a power source and for producing a signal when said voltage becomes less than a predetermined value;

said motor being arranged to be actuated in response to the signal of said voltage detecting means independently of the operation of said shutter detecting means.

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**4,389,112**

## TRANSFER SHEET SEPARATING/CONVEYING APPARATUS FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINES

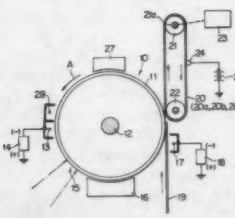
**Yoshihiro Ogata, and Yoshihiro Abe, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Japan**

**Filed Dec. 5, 1980, Ser. No. 213,687**

**Claims priority, application Japan, Dec. 10, 1979, 54-160074; Dec. 29, 1979, 54-173782; Jan. 19, 1980, 55-5000; Jan. 19, 1980, 55-5001**

**Int. Cl.³ G03G *15/16, 15/22***

**U.S. Cl. 355—3 TR** **21 Claims**



1. An apparatus for separating and conveying a transfer sheet for use in an electrophotographic copying machine in which a toner is deposited on an electrostatic latent image formed on the surface of a photosensitive drum to provide a toner image which is then transferred onto a transfer sheet under application of a transfer field and the transfer sheet is subsequently separated from the drum; characterized by the provision of

a transfer sheet separating/conveying member formed of an electrically conductive material and having a conductive surface in contact with said transfer sheet and disposed downstream of a transfer station where the transfer step takes place, as viewed in the direction of the drum,

support means associated with the separating/conveying member for positioning part thereof close to or in contact with the drum surface,

drive means for causing a movement of the separating/conveying member in a direction such that it moves in the same direction as the drum surface where it is opposed to the latter, and

a power supply means for applying a voltage of the same polarity as that of the transfer sheet to the separating/conveying member.

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**4,389,113**

## IMPROVED DEVELOPING DEVICE FOR TWO-COLOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

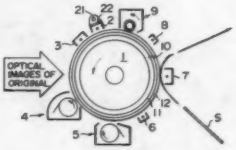
**Fuyuhiko Matsumoto, Wako; Kunihiko Ikeda, Kodaira, and Shuichi Tsushima, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed May 8, 1981, Ser. No. 261,782**

**Claims priority, application Japan, May 15, 1980, 55-116426**

**Int. Cl.³ G03G *15/09***

**U.S. Cl. 355—3 DD** **13 Claims**




1. In a two-color electrophotographic copying apparatus for making two-color copies from two-color originals, by forming two latent electrostatic images with opposite polarities on a latent electrostatic image bearing member and developing the two latent electrostatic images successively by developers charged to opposite polarities which developers are respectively held in a first magnetic development apparatus and in a second magnetic development apparatus, the improvement wherein at least said first development apparatus comprises:

a magnetic roller comprising a non-magnetic sleeve with an inner magnet, which non-magnetic sleeve is rotatable relative to said inner magnet, and attracts developer to the peripheral surface thereof through the magnetic force of said magnet disposed inside said non-magnetic sleeve, and transports the attracted developer to a development section between the gap between said non-magnetic sleeve and the surface of said latent electrostatic image bearing member, said non-magnetic sleeve having ridges and grooves capable of retaining said developer therein on the surface thereof during development, the height of said ridges from the bottom of said grooves being in the range of 0.5 mm to 2.5 mm.

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**4,389,114**

## ROLL FIXING APPARATUS FOR A COPYING MACHINE

**Theodore N. Westerman, Easton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.**

**Filed Jan. 25, 1982, Ser. No. 342,562**

**Int. Cl.³ G03G *15/00, 15/20***

**U.S. Cl. 355—3 FU** **5 Claims**

1. In an electrophotographic copying machine having instru-

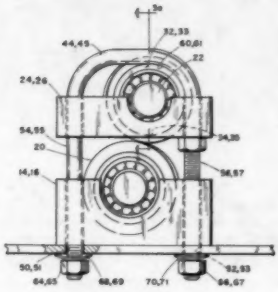
mentalities for producing a toner image on a copy sheet, a device for fixing the toner image onto the copy sheet, said device comprising:

A. a support means,

B. a pair of spaced apart lower end blocks resting on said support means,

C. a lower pressure roller extending between said spaced apart lower end blocks,

D. lower bearing means mounted on said lower pressure roller supported by said pair of lower end blocks for rotatably supporting said lower pressure roller,



E. an upper pressure roller resting on said lower pressure roller,

F. upper bearing means mounted on said upper pressure roller for rotatably supporting said upper pressure roller, and

G. clamping means engaging said upper bearing means, said lower end blocks and said support means for pressing said upper and lower pressure rollers together under substantially high pressure and for mounting said device on said support means.

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**4,389,115**

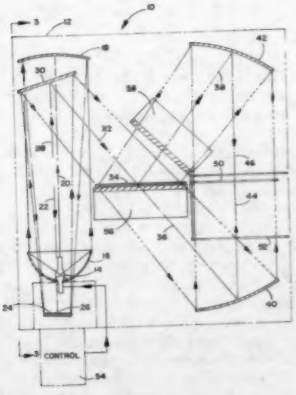
**OPTICAL SYSTEM**

**Thomas A. Richter, 711 15th St., Hermosa Beach, Calif. 90254**

**Filed Aug. 6, 1981, Ser. No. 290,435**

**Int. Cl.³ G03B *27/32, 27/52***

**U.S. Cl. 355—26** **14 Claims**



**1. An optical system comprising:**

**a light source, a reflector positioned with respect to said light source to direct a substantial amount of light from said light source along a beam path;**

**a plurality of optical elements positioned along said beam path, said optical elements comprising an integrator mirror having a plurality of facets and at least two curved mirrors, said beam path terminating at a focal plane, said optical elements being configured so that light arriving at said focal plane from said lamp is substantially collimated and is substantially uniformly distributed over said focal plane.**

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**4,389,116**

**METHOD AND APPARATUS FOR MANUFACTURING SEAMLESS PRINTING ROLL**

**Bruno Vogel, Hubeweg, Fed. Rep. of Germany, assignor to N.V. APR Europe S.A., Brussels, Belgium**

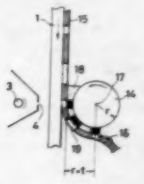
**Division of Ser. No. 108,096, Dec. 28, 1979, Pat. No. 4,298,680.**

**This application Jun. 17, 1981, Ser. No. 274,600**

**Claims priority, application Japan, Feb. 14, 1979, 54-15824**

**Int. Cl.³ G03B *27/04***

**U.S. Cl. 355—85** **11 Claims**



**1. Apparatus for manufacturing a seamless printing roll comprising: a rigid plate which is transparent to an actinic light; an actinic light source provided on one side of said rigid plate; means for supporting a process cylinder, said means being provided on the side of said rigid plate opposite said light source, means for adjusting the space between said rigid plate and said process cylinder, means for delivering a photo-sensitive material into said space during relative movement of said rigid plate with respect to the rotary shaft of said process cylinder to form a photo-sensitive layer on said process cylinder, and means for effectuating said relative movement wherein said photo-sensitive layer is formed to a predetermined thickness on said process cylinder and is simultaneously exposed with an image.**

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**4,389,117**

**MICROFICHE SEPARATOR AND TRANSPORT APPARATUS**

**Thomas D. Floyd, Morris Township, Morris County, N.J.; Roland D. Nelson, and Ronald L. Bonagura, both of San Jose, Calif., assignors to Consolidated Micrographics, Inc., Laguna Niguel, Calif.**

**Filed May 21, 1981, Ser. No. 266,111**

**Int. Cl.³ G03B *27/20***

**U.S. Cl. 355—87** **14 Claims**

**1. An apparatus for separating and transporting a fiche master in a fiche duplicating machine, comprising:**

**a magazine for holding a stack of fiche masters;**

**a platen movable between a home position and a copying station of the duplicating machine;**

**carriage means movable between a first and a second position;**

**first vacuum means on the carriage means operable between an initial position and a final position against the stack;**

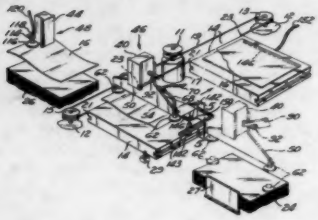
**first actuator means for operating the first vacuum means from the initial to the final position;**

**first biasing means for operating the first vacuum means from the final to the initial position to effect lifting of a second fiche from the top of the stack;**

second vacuum means on the carriage means operable between an initial position and a final position against a first fiche master on the platen;

second actuator means for operating the second vacuum means from the initial to the final position in timed relation with the operation of the first vacuum means;

second biasing means for operating the second vacuum means from the final to the initial position to effect lifting of the first fiche master from the platen;



drive means for moving the carriage means from the first to the second position to transport the first fiche master from the platen to an exit hopper and to transport the second fiche master from the stack to the platen; and

means for moving the platen from the home position to the copying station to perform a copying operation and return to the home position following the copying operation.

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**4,389,118**

**COLOR METER**

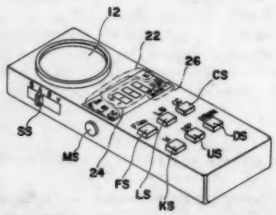
**Yoshio Yuasa, Kawachinagano; Norio Ishikawa, Osaka, and Izumi Horie, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan**

**Filed Nov. 25, 1980, Ser. No. 210,398**

**Claims priority, application Japan, Nov. 28, 1979, 54-154753**

**Int. Cl.³ G01J *3/50***

**U.S. Cl. 356—404** **16 Claims**




**1.** A color meter for use with a color image recording apparatus comprising a first light measuring circuit for outputting a signal corresponding to the intensity of the incident light of a red region from among the incident light rays, a second light measuring circuit for outputting a signal corresponding to the intensity of the incident light of a green region, a third light measuring circuit for outputting a signal corresponding to the intensity of the incident light of a blue region, a setting apparatus for outputting a signal corresponding to a color temperature parameter of an image capturing member to be used, a processing circuit which can produce a light balancing factor and/or a color compensation factor in response to a necessary signal from the signals from said first, second and third light measuring circuit and the signal from said setting apparatus, and a display apparatus which can display the light balancing factor and/or the color compensating factor according to the signal of the processing circuit.

**4,389,119**

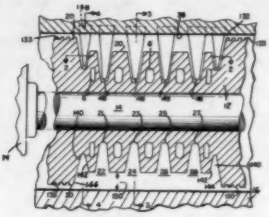
**ROTARY PROCESSORS**

**Lefteris N. Valsamis, West Haven, Conn., and Zehev Tadmor, Haifa, Israel, assignors to USM Corporation, Farmington, Conn.**

**Filed Jan. 4, 1982, Ser. No. 336,936**

**Int. Cl.³ B01F *7/02, 7/10;* B29B *1/06***

**U.S. Cl. 366—99** **19 Claims**



**1.** In a rotary processor comprising a rotatable element carrying a plurality of processing channels extending inwardly from the rotor surface and a stationary element having a coaxial closure surface operationally arranged with said channels to provide a plurality of enclosed processing passages and where each processing passage includes inlet and outlet means and a material blocking end wall surface providing member associated with the stationary element and arranged so that material fed to the passage through the inlet can be blocked at the end wall surface for processing and/or discharge from the passage through the outlet,

the improvement where the rotor surface carrying the processing channels is spaced apart from the closure surface by a relatively wide clearance adapted to permit interchange of substantial material from passage to passage about substantially the entire circumference of each passage and where a collection channel including opposed walls carried by the surface rotor and extending inwardly from the rotor surface is arranged adjacent an end processing channel to collect material passing through the clearance between the closure surface and the rotor surface separating the collection channel and the adjacent end processing channel and outlet means and a blocking member providing a material blocking end wall surface associated with the stationary element and arranged with the collection channel so that material collected in the collection channel can be blocked for discharge from the collection channel.

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**4,389,120**

**ROTARY VIBRATOR WITH RESILIENT SHOCK MOUNT TO PROVIDE LINEAR MOVEMENT**

**Theodore S. Wadensten, P.O. Box 8, Stilson Rd., Wyoming, R.I. 02898**

**Continuation-in-part of Ser. No. 142,469, Apr. 21, 1980, abandoned. This application Jun. 5, 1980, Ser. No. 156,792**

**Int. Cl.³ B01F *11/00***

**U.S. Cl. 366—126** **6 Claims**

**1.** A unidirectional vibrator apparatus which is adapted to provide a force for moving a housing secured to an exterior member such as a screen, conveyor, sieve and the like, said vibrator apparatus including:

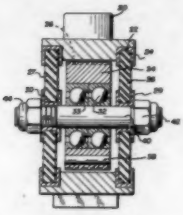
(a) a housing within which the vibrator apparatus is carried, said housing having a central bore and mounting means for securing the housing to said exterior member;

(b) a shaft carried within said central bore and disposed to retain the vibration apparatus in a precise configuration;

(c) at least one eccentric weight carried by said shaft and within said bore and rotatable at a prescribed speed around the axis of said shaft, said moved weight produc-

ing the desired forces producing amplitude and rate of vibration;

(d) at least one resilient shock absorbing means formed as a substantially flat washer and disposed at one end of the central bore of the housing, said resilient shock absorbing washer affixed to an outer ring secured to said housing and disposed to remain in said secured condition and an inner ring means secured to said resilient shock absorbing washer, said inner ring also affixed to said resilient shock



absorbing washer so as to remain in this secured condition and position during vibrational actuation, this inner ring carrying said shaft so that said shock absorbing washer prevents transmission of the vibrational forces directly to the housing of the vibration apparatus, and

(e) means for securing said housing to an exterior member to be vibrated and with the securing of said vibrator apparatus the vibration forces produced are transferred through the resilient shock absorbing means and the rotating of the eccentric weight produces a unidirectional force.

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## 4,389,121
## SPEECH SYNTHESIZER TIMEPIECE WITH ALARM FUNCTION

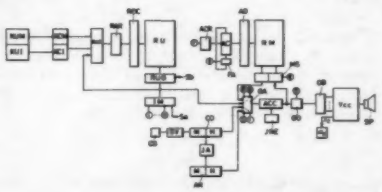
**Shintaro Hashimoto, Ikoma; Akitaka Morita, Nara, and Hiroshi Tsuda, Uji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Feb. 13, 1981, Ser. No. 234,862**

**Claims priority, application Japan, Feb. 15, 1980, 55-18298; Feb. 22, 1980, 55-21804**

**Int. Cl.³ G04B *21/08, 23/02***

**U.S. Cl. 368—63** **4 Claims**



1. A timepiece capable of delivering an alarm sound or message when an alarm time setting is reached, said timepiece comprising:

an output mode selector for selecting one of at least three modes of output for said timepiece;

means for periodically delivering audible announcements of time when said timepiece is in a first of said at least three modes;

alarm time announcement means responsive to said output mode selector for delivering an audible indication of an alarm time setting in the form of synthesized voices when said timepiece is in a second of said at least three modes; and

means for delivering a visual display of the alarm time setting when said timepiece is in a third of said at least three modes.

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## 4,389,122
## CLOCK WITH ELECTRIC OSCILLATOR-CONTROLLED MOTOR

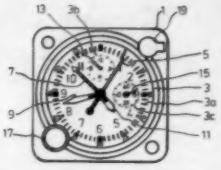
**Gerald Dubois, Le Lieu, and Kaspar Kenel, Niederdorf, both of Switzerland, assignors to Revue Thommen AG, Switzerland**

**Filed Jan. 26, 1981, Ser. No. 228,389**

**Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 8027665[U]**

**Int. Cl.³ G04F *8/00, 10/00***

**U.S. Cl. 368—110** **15 Claims**



1. A clock comprising: an electric motor which is controllable by an electric oscillator for the output of a timed movement; wheelwork means connected to and driven by said electric motor; a plurality of hands connected to said wheelwork means for movement to indicate by their respective positions, increments of time; a manually operable actuator connected to said wheelwork means; at least one of said plurality of hands comprising at least one stoppable hand for showing by its position an elapsed time; said wheelwork means including coupling means engageable and disengageable by said actuator to and from said motor and said at least one stoppable hand for respectively starting and stopping movement of said at least one stoppable hand; and mechanical resetting means connected to said actuator and engageable with said stoppable hand to reset the position of said stoppable hand to an initial position; said actuator being so cooperable with said coupling means and said resetting means that said at least one stoppable hand can be started, stopped and reset by purely mechanical force transmitted to said stoppable hand exclusively from said actuator by way of said coupling means, said coupling means comprising a lever connected to and movable by said actuator, a shaft rotatably mounted on said lever, a first toothed wheel connected to said shaft, a second toothed wheel connected to said at least one stoppable hand, said shaft connected to said motor for rotation; said actuator movable to engage said first toothed wheel with said second toothed wheel to start movement of said stoppable hand and to disengage said first toothed wheel from said second toothed wheel to stop movement of said stoppable hand.

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## 4,389,123
## ELECTRONIC ALARM WATCH

**Ichiro Horikoshi; Fumikazu Murakami; Yoshiaki Hara; Susumu Fujita, and Osamu Ide, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan**

**Filed Oct. 10, 1980, Ser. No. 195,931**

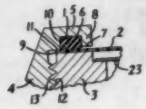
**Claims priority, application Japan, Oct. 18, 1979, 54/144279[U]**

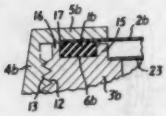
**Int. Cl.³ G04C *21/00***

**U.S. Cl. 368—250** **15 Claims**

1. In an electronic alarm watch having a resonant plate which is vibrationally driven during use of the watch for emitting an alarm sound: a supporting frame for directly or indirectly supporting a peripheral portion of the resonant plate so as to enable the plate to undergo vibration; a watch case; a gasket which contacts the resonant plate; the watch case having a portion which overhangs the gasket and which directly

or indirectly axially compresses the gasket against the resonant plate; a recess defined by adjacent portions of the watch case and the supporting frame, the gasket being disposed in said recess and the recess being further defined by an annular outer





sidewall in contact with the supporting frame and an annular inner sidewall which is spaced from and makes no contact with the resonant plate; and securing means for securing together the supporting frame and the watch case.

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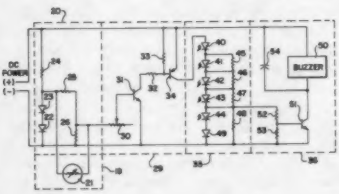
**4,389,124**

## DEVICE FOR MONITORING SELECTED OPERATING CONDITIONS OF COMBUSTION WITHIN A SOLID FOSSIL FUEL BURNING FURNACE

**Bruce A. Longenecker, 7826 Hartman Rd., Wadsworth, Ohio 44281**

**Filed May 18, 1981, Ser. No. 264,277**
**Int. Cl.³ G01K** *7/20, 7/22*
**U.S. Cl. 374—147** **5 Claims**




1. A device for monitoring a solid fossil fuel burning furnace having a discharge flue, comprising:

means for monitoring and providing a signal proportional to the temperature in the discharge flue;

said means for monitoring including transducer means monitoring the temperature in the discharge flue and having a resistance proportional thereto;

said means for monitoring also including circuit means providing a signal whose voltage is proportional to said resistance and detecting whether said voltage at least equals a preselected magnitude;

said circuit means including adjustable base resistor means for selecting said predetermined magnitude, a first transistor detecting whether said voltage signal at least equals said preselected magnitude and thereupon providing an output signal proportional to said resistance, and a second transistor receiving and amplifying the output signal from said first transistor and providing a signal proportional to the temperature in the discharge flue; and,

a plurality of light means for receiving said signal from said second transistor to provide a visual indication of selected operating conditions of combustion within the furnace, the number of said plurality of light means emitting illumination at a given time being indicative of the selected operating conditions of combustion within the furnace at that time.

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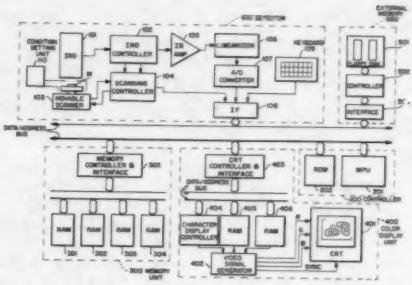
**4,389,125**

## METHOD FOR MEASURING SURFACE TEMPERATURE DISTRIBUTION AND SYSTEM

**Ikuro Kobayashi, Machida, and Kyozo Shimizu, Tokyo, both of Japan, assignors to VLSI Technology Research Association, Tokyo, Japan**

**Filed Sep. 22, 1980, Ser. No. 189,635**
**Int. Cl.³ G01K** *7/01, 25/18;* **H05B** *1/02*
**U.S. Cl. 374—164** **20 Claims**



1. A method for measuring a surface temperature distribution of a sample, comprising the steps of:

(a) keeping a sample, comprising a plurality of coexisting materials with different radiation coefficients of radiated rays at the same temperature and divided into a narrowly subdivided plurality of surface regions, at a first known temperature and measuring an amount or rays radiated respectively from each of the narrowly subdivided plurality of regions on the surface of said sample;

(b) keeping said sample at a second known temperature and measuring an amount of ray radiated respectively from each of said narrowly subdivided plurality of surface regions;

(c) keeping said sample at an unknown temperature and measuring an amount of ray radiated respectively from each of said narrowly subdivided plurality of surface regions; and

(d) obtaining the temperatures of respective ones of said narrowly subdivided plurality of surface regions from said amount of radiated rays measured at said first and second known temperatures, and said amount of radiated rays measured at said unknown temperature.

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**4,389,126**

## SERIAL IMPACT PRINTER HAVING TWO PRINTING MODES

**Yoshikiyo Honma; Jun Shimogawara; Muneyoshi Nagata; Yukihiko Oka; Yukiaki Koyanagi; Yukiyoshi Hosoya, and Takashi Hada, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Jun. 29, 1981, Ser. No. 278,033**

**Claims priority, application Japan, Jun. 27, 1980, 55-87427; Jun. 27, 1980, 55-87428; Jun. 27, 1980, 55-87429; Jun. 27, 1980, 55-87430; Jun. 27, 1980, 55-87431; Jun. 27, 1980, 55-87432; Jun. 27, 1980, 55-87433; Jun. 27, 1980, 55-87434; Jun. 27, 1980, 55-87435**

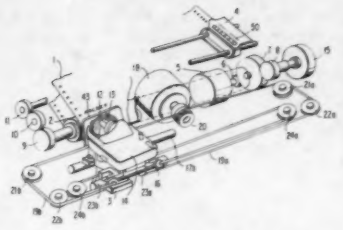
**Int. Cl.³ B41J** *3/54, 1/50, 3/50*
**U.S. Cl. 400—82** **9 Claims**

1. A serial impact printer for serially printing on a print receiving member comprising:

a carriage for sliding along said print receiving member;

a character carrying member rotatably mounted to said carriage and having a plurality of fingers, at least one formed-character being disposed on each of said fingers;

a plurality of wires mounted on said carriage and behind said character carrying member with respect to said print receiving member; and



means for actuating said plurality of wires, a formed-character printing being achieved by impacting a selected character on said character carrying member by means of at least one of said plurality of wires and a dot-matrix printing being achieved by directly impacting said print receiving member by means of selected ones of said plurality of wires.

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**4,389,127**

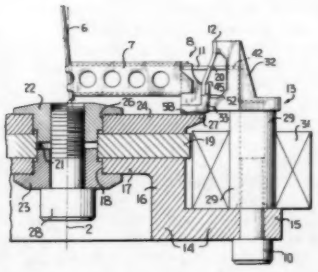
## HIGH SPEED DOT MATRIX IMPACT PRINTER

**James E. Bellinger, Melbourne, Fla., assignor to Florida Data Corporation, Melbourne, Fla.**

**Continuation of Ser. No. 101,811, Dec. 10, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 273,123**

**Int. Cl.³ B41J 3/12**

**U.S. Cl. 400—124** **27 Claims**



1. A module for a multi-module dot matrix printer head comprising:

a selectively actuatable electromagnet,

a pole piece for said electromagnet,

a permanent magnet,

a pole piece for said permanent magnet,

a magnetic circuit including said electromagnet and permanent magnet and said pole pieces,

said pieces having faces lying generally perpendicular to and in close proximity to one another,

an armature having two adjacent perpendicular surfaces lying parallel, respectively, to said faces of said pole pieces with one of said surfaces contacting one of said faces when said electromagnet is not actuated,

a pair of crossed flexures providing a pivotal axis for said armature, said pivotal axis lying in the plane of the face of said one of said pole pieces and remote from both of said pole pieces such that when the electromagnet is not actuated each surface of the armature is attracted toward the respective pole piece face to which each such surface is parallel when the electromagnet is not actuated, and

wherein actuation of the electromagnet (a) produces a bucking magnetic field which at least partially cancels the magnetic field of the permanent magnet and (b) results in (i) the release of prestressed flexures in response to reduction in magnetic forces and torques on the flexures and (ii) the armature rotating about the pivotal axis thereof responsive to the release of the flexures, each surface of the armature thereby moving away from the respective pole piece face to which each such surface is parallel when the electromagnet is not actuated.

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**4,389,128**

## PRINT HEAD FOR A DOT MATRIX PRINTER

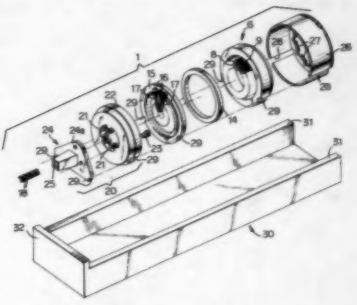
**Kiyomitsu Asano, Musashino; Toshikatsu Kondo, and Atsuo Sakaida, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi and Nippon Telecommunication Engineering Company, Tokyo, both of, Japan**

**Filed Aug. 5, 1981, Ser. No. 290,299**

**Claims priority, application Japan, Aug. 14, 1980, 55-115284[U]**

**Int. Cl.³ B41J 3/12**

**U.S. Cl. 400—124** **7 Claims**



1. A print head for a dot-matrix printer comprising:

a plurality of print wires;

a guide member with a nose portion for guiding said print wires;

a plurality of armatures corresponding to said print wires respectively;

an armature support member for supporting said armatures at one end thereof;

an electromagnetic armature drive device having, for selectively driving said armatures, a permanent magnet and a magnetic member;

a pair of positioning shoulders formed in the external periphery of each of said guide member, said armature support member and said magnetic member, said positioning shoulders of all of said members being brought into alignment with one another to establish relative positional alignment of said members when they are assembled together; and

a connecting member fitting on said guide member, said armature support member, said magnetic member to connect them in that order with the aid of said positioning shoulders, one axial end of said connecting member being secured to the external periphery of said guide member, and the other axial end of said connecting member being provided with a plurality of resilient tongues engaging said magnetic member for biasing said magnetic member and said armature support member toward said guide member.

6. A print head for a dot-matrix printer comprising:

a plurality of print wires;

a print wire drive device including a plurality of armatures connected to said print wires respectively, and an electromagnetic armature drive unit having a magnetic member for selectively actuating said armatures;

a guide member having a nose portion for guiding said print wires and a cover portion for covering one side of said print wire drive device; and

a hollow cylindrical connecting member fitted on said guide member and said magnetic member and connecting said two members, one axial end of said cylindrical connecting member being secured to the external periphery of said guide member and the other axial end thereof having a plurality of circumferentially spaced resilient tongues which extend radially inwardly of said cylindrical connecting member, said resilient tongues engaging one end face of said magnetic member on the other side of said print wire drive device thereby biasing said magnetic member toward said guide member for firm connection of said two members.

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**4,389,129**

## TYPE WHEEL PRINTER

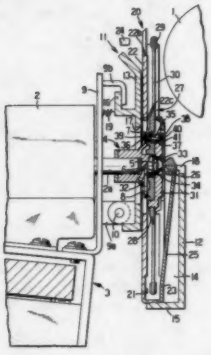
**Toshiaki Sugiura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Jun. 18, 1981, Ser. No. 275,013**

**Claims priority, application Japan, Jun. 30, 1980, 55-89346; Jun. 30, 1980, 55-89347**

**Int. Cl.³ B41J *1/30***

**U.S. Cl. 400—144.2** **13 Claims**



1. In combination, a type wheel printer having a carriage, a motor supported by the carriage, rotatable shaft means driven by the motor;

a type wheel having a hub, a plurality of spokes extending from said hub with a type supported at the free end of each of said plurality of spokes, said hub having a central opening engageable with said shaft means, said hub further having axial latch means for latching said type wheel to said shaft means when the end of said shaft means is inserted into said central opening in an axial direction, said type wheel being susceptible to rotate with said shaft through frictional contact of said type wheel with said shaft means in a rotationally unlatched condition of said shaft means with respect to said type wheel;

rotational latch means for establishing a rotationally latched state wherein said type wheel is latched to said shaft means in the rotational direction of said shaft means;

control means to operate said motor so as to rotate said shaft means a predetermined amount more than one turn upon the closing operation of at least one electric switch; and

detent means for preventing said type wheel from rotating more than a predetermined angular amount due to said frictional contact so as to thereafter cause said rotational latch means to establish said rotationally latched state while said shaft means to which said type wheel is axially latched by said axial latch means is rotated in said not rotationally latched state in response to actuation of said control means.

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**4,389,130**

## DEVICE FOR COUPLING AND RELEASING A DAISY WHEEL TYPE MEMBER

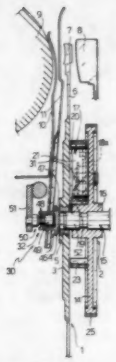
**Nicolo Giolitti, Ivrea, Italy, assignor to Remington Ind. E Com. De Sistemas Para Escritoria S.A., Rio de Janeiro, Brazil**

**Filed Apr. 8, 1982, Ser. No. 366,563**

**Claims priority, application Italy, Apr. 30, 1981, 67588 A/81**

**Int. Cl.³ B41J *1/24***

**U.S. Cl. 400—144.2** **10 Claims**



1. A typewriter having a daisy wheel type member (1) having an axial hole, and a drive unit (2) which drives the said daisy wheel (1) to rotate about its axis and which serves as a support element for the said daisy wheel (1), and a device for coupling the said daisy wheel (1) with respect to the drive unit (2), said coupling device (30) comprising:

a spindle (15) projecting axially from the said drive unit (2) and engageable in said axial through hole (4) of the daisy wheel (1);

means for creating a first thrust tending to separate said daisy wheel (1) from said drive unit (2), said means for creating a first thrust comprising first resilient means (34*a*,34*b*) engaging said daisy wheel and being carried by said drive unit (2) on the side of said drive unit facing said daisy wheel (1);

means for creating a second thrust acting on said daisy wheel, said second thrust having a greater magnitude and opposite direction from said first thrust, said means for creating a second thrust comprising a second resilient means (57) which engages said daisy wheel on the side opposite that facing said drive unit (2); and

manual control means for selectively disengaging said second resilient means from said daisy wheel, thus eliminating said second thrust and permitting said first thrust to disengage said daisy wheel from said spindle.

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**4,389,131**

## PRINTER WITH ELECTROMAGNETIC DRIVE YOKES

**Hiroatsu Kondo, Zushi; Toshiaki Ozawa, Higashi, and Hideaki Miyakawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 31, 1980, Ser. No. 174,000**

**Claims priority, application Japan, Aug. 2, 1979, 54-98956**

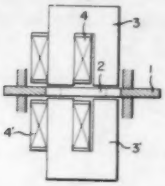
**Int. Cl.³ B41W *9/30***

**U.S. Cl. 400—157.2** **9 Claims**

1. An electromagnetic driving mechanism, comprising:

a rectilinearly reciprocal member having a magnetic portion

having poles, the poles of said magnetic portion being aligned substantially in parallel with a line in the direction of reciprocation of said member and being separated by a line of polarization;




a plurality of yokes disposed substantially at right angles to said line of reciprocation and opposed to said magnetic portion, such that said polarization line opposes the surfaces of said yokes; and

coils wound on said yokes for controlling the reciprocation of said member.

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**4,389,132**

## EYEGLASS PEN CLEANER

**Alfonso L. Valadez, P.O. Box 4688, San Ysidro, Calif. 92073**

**Filed Dec. 7, 1977, Ser. No. 858,259**

**Int. Cl.³ B43K *29/12***

**U.S. Cl. 401—195** **4 Claims**

1. An eyeglass lens cleaner formed in the general shape of a pen comprising a cap member and a tubular member, said cap member containing a chamber housing a dispenser of wiping material and having an elongated slot for withdrawing said material therefrom; said tubular member having fixed at a first end thereof a porous tip; said tubular member holding therein a cleaning solution and conveying means intermediate said tip and said container for bringing cleaning solution to said tip, in which

said cap member is shaped at a first end with a blind recess, the outer wall of which blind recess is of a shape to matingly detachably fit about alternatively either the first end or the second end of the tubular member such that when the said cap member is fitted about the first end of the tubular member, the porous tip of the tubular member is completely enclosed, such that an end wall bordering said blind recess serves to seal the interior of the blind recess from communication with the chamber housing the wiping materials, wherein

the said dispenser consists of a spool rotatably mounted in said chamber of said cap member, with absorbent sheet material rolled on said spool.

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**4,389,133**

## PLASTIC CONNECTORS FOR CORRUGATED MATERIAL

**Steven M. Oberst, Willard, Ohio, assignor to Acorn Corrugated Box Co., Bedford Park, Ill.**

**Filed Mar. 9, 1981, Ser. No. 241,661**

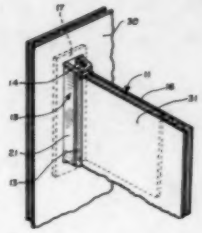
**Int. Cl.³ B25G *3/00*; F16B *7/08, 9/00*; F16L *41/00***

**U.S. Cl. 403—230** **8 Claims**

1. A female connector for use with a corrugated material, comprising:

a back portion having a thickness dimension suitable for insertion in the corrugated material; and

a generally U-shaped receiving portion, extending outwardly from said back portion and defining a receiving slot therein, which receiving slot is open at the top and




closed at the bottom, and the U-shaped receiving portion is uninterrupted except for the receiving slot, top and back portion.

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**4,389,134**

## COUPLING OF A TUBE TO A RING MEMBER

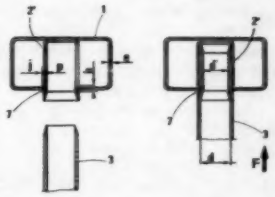
**Francois Colas, Bourg la Reine, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France**

**Filed Feb. 3, 1981, Ser. No. 231,175**

**Claims priority, application France, Mar. 17, 1980, 80 06185**

**Int. Cl.³ B25G *3/00*; F16B *9/00*; F16L *41/00***

**U.S. Cl. 403—263** **4 Claims**

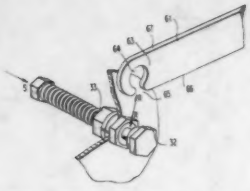


1. A coupling for a male tube member and a ring member comprising a pair of tube elements formed of aluminum or the like, said tubes having walls which are relatively thin with respect to tube diameter, one tube being the male element of the connection, the other tube being a female element, said male tube having a beveled end face, said female tube having a conically bored end face for cooperative engagement with said male end face, said female tube located within the ring member having a small thickness, the inside diameter of said ring member being just slightly larger than said female tube to permit a small clearance therebetween, said male tube when forcibly inserted into said female tube, expanding the same into tight engagement with said ring member.

## 4,389,135
## RELEASABLE LOCKING DEVICE

Jack Peters, 5 Pinehurst, Wildwood Estates, Prescott, Ariz. 86301

Filed Jan. 30, 1981, Ser. No. 278,927
Int. Cl.³ B25G 3/18; F16B 21/00; F16D 1/00
U.S. Cl. 403—327 12 Claims



1. A releasable self-contained locking device for pivotally locking first and second members, and comprising:

a hollow support assembly extending through an opening formed in a first of said members, said hollow support assembly including an enlarged head portion disposed on a first side of said first member with an internal bore extending completely through said hollow support assembly;

a locking member including a stud and an enlarged locking portion, said stud extending completely through said internal bore and said enlarged locking portion adjacently disposed to said enlarged head portion of said hollow support assembly;

said second member including an opening having an inlet portion extending inwardly from an edge of said second member adjoining an interior portion of enlarged diameter, said inlet defining a gap sufficiently large to allow passage of said stud portion therethrough and sufficiently small to block passage of said enlarged locking portion and said interior portion defining an opening sufficiently large to enclose said enlarged locking portion;

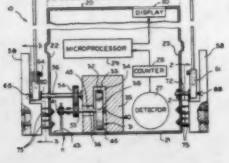
resilient biasing means abutting said locking member and said support assembly for biasing said locking member through said interior portion of said opening and into said internal bore; and

guidance means for automatically aligning said interior portion of said opening with enlarged head portion, allowing said enlarged head portion to extend through said opening and lock said to second member into pivoted engagement with said first member.

## 4,389,136
## METHOD OF DETERMINING DENSITY

Robert J. Fehrenbach, Wauwatosa, Wis., assignor to Seaman Nuclear Corporation, Milwaukee, Wis.

Filed Jan. 23, 1981, Ser. No. 227,913
Int. Cl.³ E01C 7/18, 23/00
U.S. Cl. 404—75 4 Claims




3. A method of determining the density of a top layer of asphaltic paving material which is compacted by a roller, said top layer being disposed on a base layer of a second material comprising the steps of:

determining the density $D_b$ of the base layer prior to the application of the top layer,

determining the composite density $D_g$ of the top layer and base layer after the application of the top layer,

determining the density $D_t$ of the top layer from the expression

$$D_t = D_b + \frac{D_g - D_b}{1 - e^{-t/k}}$$

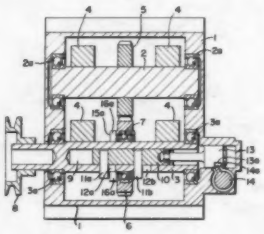
where t is the thickness of the top layer; and k is an instrument constant,

said density $D_t$ indicating the need for further rolling.

## 4,389,137
## OSCILLATOR FOR SOIL OR ROAD TAMPERS

Franz Riedl, Munich, Fed. Rep. of Germany, assignor to Wacker-Werke GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,184
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043719
Int. Cl.³ E01C 19/38
U.S. Cl. 404—113 6 Claims



1. An oscillator, for soil or road tampers, comprising:

a housing;

two unbalanced shafts which are rotatably journalled in said housing and are parallel to each other;

centrifugal weights respectively rigidly connected to said unbalanced shafts;

a first gear rigidly connected with one of said unbalanced shafts;

a second gear rotatably arranged on the other of said unbalanced shafts in such a way that it can also be shifted in the direction of rotation, said first and second gears being adapted to mesh to drive said unbalanced shafts in opposite directions;

stop faces respectively provided on both sides of said second gear, said stop faces extending nearly radially as well as axially, and pointing in the same rotational direction;

a slide piece arranged in, and axially shiftable in, said unbalanced shaft of said second gear; and

two shift pins respectively anchored in said slide piece, one on each side of said second gear, for effecting said shifting of said second gear in the direction of rotation, one end of each of said shift pins projecting out of said unbalanced shaft of said second gear through associated longitudinal slots in said last-mentioned unbalanced shaft, said shift pins being axially spaced from one another in said slide piece by such a distance that one of said shift pins is always located just out of alignment with said stop face located on the same side of said second gear when the other of said shift pins, on the other side of said second gear, is in complete alignment with said stop face associated therewith.

4,389,138

## DRAIN PIPE

Gert W. Söderström, 62 Hammarbyvägen, Uplands Väsby S.194-00, Sweden

PCT No. PCT/SE79/00245, § 371 Date Jul. 25, 1980, § 102(e) Date Jul. 25, 1980, PCT Pub. No. WO80/01180, PCT Pub. Date Jun. 12, 1980

PCT Filed Dec. 3, 1979, Ser. No. 199,725

Claims priority, application Sweden, Dec. 4, 1978, 7812472; Jul. 16, 1979, 7906140

Int. Cl.³ E02B *13/00*

U.S. Cl. 405—43 6 Claims

1. A drain pipe, comprising an outer pipe casing, at least one longitudinal opening in a lower surface of the pipe casing, a wall extending upwardly from each longitudinal edge of the at least one opening to form between the walls a water riser space for drain water, a plurality of openings at an upper edge of each of the walls, the walls being connected to an upper inside surface of the pipe casing whereby water can flow into channels formed between the walls and the pipe casing.

4,389,139

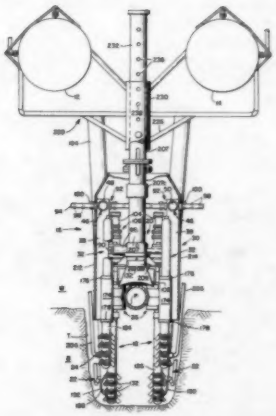
## OSCILLATING JET HEAD UNDERWATER TRENCHING APPARATUS

Robert M. Norman, 128 Nickelson Pkwy., Lafayette, La.

Filed Sep. 19, 1980, Ser. No. 188,923

Int. Cl.³ E02F *5/02*

U.S. Cl. 405—163 65 Claims



1. An underwater trenching apparatus for burying pipeline and the like comprising:

a frame for positioning about the pipeline to be buried,

said frame including frame members positioned on each side of said pipeline,

roller means connected to at least one of said frame members for engagement with said pipeline, and

cutting means secured to said apparatus for cutting a trench in a formation and having oscillating means connected thereto for oscillating the cutting means along a stationary vertical axis positioned on the pipeline side of the frame and in accordance with a preselected period and sweep.

4,389,140

## LOCKING DEVICE FOR A PILE-SHAPED ELEMENT

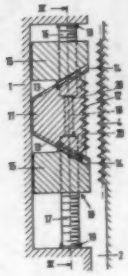
Cornelis Bordes, Hardinxveld-Giessendam, Netherlands, assignor to Marine Structure Consultants (MSC) BV, Hardinxveld-Giessendam, Netherlands

Filed Jun. 8, 1981, Ser. No. 271,110

Claims priority, application Netherlands, Jun. 13, 1980, 8003462

Int. Cl.³ E02B *17/08*; E02D *21/00*; B66F *1/00*

U.S. Cl. 405—195 6 Claims



1. A locking device for an elongated pile-shaped element of the type slideably received in the longitudinal direction in a body having buoyancy, said locking device comprising:

at least one toothed rack having a plurality of teeth associated with at least a portion of said pile-shaped element in the longitudinal direction;

at least one locking means associated with said body for lockably engaging a predetermined portion of a said toothed rack, said locking means defining a substantially isosceles trapezoidal structure having gear teeth disposed along the large base of said structure in opposing relationship to said toothed rack and having first and second opposing substantially smooth surfaces each gradiently disposed between the small base of said trapezoidal structure and said large base, said locking means being movable between a first position wherein said gear teeth are in a non-engaging relationship with said toothed rack and a second position wherein said gear teeth are in an engaging relationship with said toothed rack;

guide means for moving said locking means relative to said toothed rack including first guide block means defining a first bearing surface in constant contacting relationship with said first smooth surface during movement of said at least one locking means between said first and second positions, and second guide block means defining a second bearing surface in constant contacting relationship with said second smooth surface during movement of said at least one locking means between said first and second positions; and

displacing means for jointly or separately displacing each of said first and/or second guide block means vertically and at predetermined rates of speed relative to one another, and for controllably and responsively displacing said locking means horizontally and/or vertically relative to said toothed rack by virtue of the constant contacting relationship of said first and second bearing surfaces with said first and second smooth surfaces, respectively, whereby

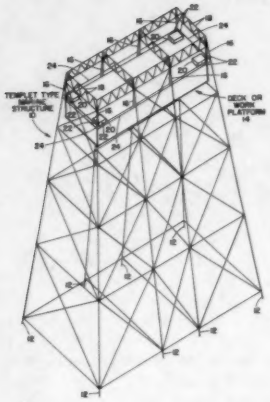
said gear teeth of said locking means are controllably directed in horizontal and/or vertical directions relative said pile-shaped element to effect locking relationship thereof with said toothed rack.

4,389,141

## MARINE STRUCTURE HAVING A DECK OR WORK PLATFORM SUPPORTED BY ABSORBING MECHANISMS

Norman E. Cumings, Parker, Colo., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,716
Int. Cl.³ E02B 17/00; E04H 9/02
U.S. Cl. 405—211 4 Claims




1. A marine offshore structure for compensating for seismic shocks comprising:

(a) an exterior truss structure having its base anchored to the subsurface floor;

(b) a marine deck or work platform within said truss structure;

(c) a plurality of vertical structural members interconnecting said truss structure and said deck or working platform for suspending said deck or work platform from said truss structure, said vertical structural members being flexible along their respective length to permit horizontal movement of said truss structure relative to said deck or work platform;

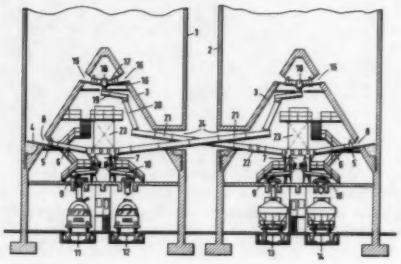
(d) means for mitigating the effects of seismic shocks on said deck or work platform, including at least one first nonlinear shock absorber means coupled laterally in a first horizontal direction between said deck or work platform and said truss structure for damping horizontal seismic forces in said first direction between said deck or work platform and said truss structure, said first nonlinear shock absorber means being substantially rigid to provide stiff damping of relatively low amplitude seismic forces and providing substantially less rigid damping during relatively high amplitude seismic forces; and at least one second nonlinear shock absorber means coupled laterally in a second horizontal direction, substantially orthogonal to said first direction, between said deck or work platform and said truss structure for damping horizontal seismic forces in said second direction between said deck or work platform and said truss structure, said second nonlinear shock absorber means being substantially rigid to provide stiff damping of relatively low amplitude seismic shocks and providing substantially less damping during relatively high amplitude seismic forces, whereby said deck or work platform is able to move relatively freely in horizontal directios when it is subjected to relatively severe seismic shocks.

4,389,142

## SILO SYSTEM FOR FLOURY LOOSE MATERIALS, PARTICULARLY CEMENT

Heinrich Klein-Albenhausen, Hamburg, Fed. Rep. of Germany, assignor to Ibau Hamburg Ingenieurgesellschaft Industriebau mbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,408
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007113
Int. Cl.³ B65G 53/26
U.S. Cl. 406—120 5 Claims



1. Apparatus for storing loose materials, such as cement, comprising:

at least two storage silos;

each silo having a base portion, a central storage tank, conveying means, and a conical cover portion over the base portion, wherein the conical cover portion of each silo has discharge openings in the lower area thereof connected to the central storage tank of the same silo by the conveying means and discharge openings in the upper area thereof for connection to the central storage tank of the other silo;

and transverse air conveying means interconnecting respectively the discharge opening in the upper area of each silo conical cover portion to the central storage tank of the other silo for transferring loose material between the silos.

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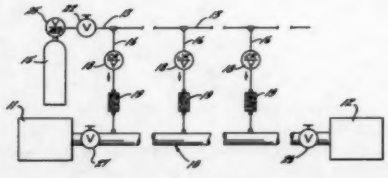
4,389,143

## METHOD OF UNPLUGGING DENSE CONVEYING SYSTEM

Robert P. Nadin, Wharton, N.J., and Jannan G. Lee, Houston, Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 16, 1981, Ser. No. 244,528
Int. Cl.³ B65G 53/16
U.S. Cl. 406—197 8 Claims



1. In a method of conveying fluidized powder or granular solids, while suspended in a fluidizing gas stream, through an elongated transfer conduit from a high pressure zone to a relatively lower pressure zone, and wherein disruptions occasionally cause said solids to de-fluidize and thereby form a flow-obstructing relatively compact solids plug in a substantial portion of said conduit,

the method of unplugging said transfer conduit which comprises:

(a) closing off said transfer conduit near the high pressure zone and near the lower pressure zone,

(b) introducing an inert (non-deleterious) gas into said transfer conduit at relatively widely spaced points along said transfer conduit, at a pressure from about several psi to a few atmospheres pressure above the pressure of the relatively lower pressure zone,

(c) maintaining said inert gas introduction at said pressure for a substantial time, sufficient for said pressure to substantially equalize along said conduit, and

(d) thereafter opening said conduit into the lower pressure zone to permit said conduit-plugging compacted solids to re-fluidize and then flow into said relatively lower pressure zone.

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**4,389,144**

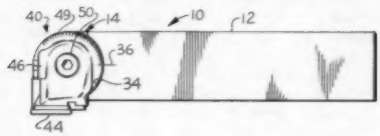
## LATHE UNIVERSAL TOOL ASSEMBLY

**Sandor Sipos, 281 Fillmore Ave., Rialto, Calif. 92376**

**Filed Dec. 29, 1980, Ser. No. 220,452**

**Int. Cl.³ B23B** *27/02, 27/08, 27/16*

**U.S. Cl. 407—82** **11 Claims**




1. A cutting tool which comprises:

a. an elongated body member having a generally rectangular cross-section;

b. said elongated body member having a head end having a step shaped upper surface thereon;

c. said step shaped upper surface being of generally circular configuration and containing a plurality of generally radially extending ribs disposed at equal angular increments thereabout;

d. said radially extending ribs on said step shaped upper surface extending through an arc of 360 degrees;

e. said head end containing a first circular recess adjacent and below said step shaped upper surface and a second circular recess of smaller diameter extending below the first circular recess;

f. said head end further containing a central bore extending through the head portion and axially aligned with both said first circular recess and said second circular recess;

g. said head end further containing a third recess extending around the lower extremity of said central bore;

h. said elongated body member having an arcuate recess adjacent said step shaped upper surface;

i. a first head assembly having a lower extremity including a lower surface of generally circular configuration having a plurality of generally radially extending ribs disposed at equal angular increments thereabout;

j. said radially extending ribs on the lower surface of said first head member extending through an arc of 360 degrees;

k. said ribs of said first head assembly and said ribs of said body portion having the same circular spacing therebetween;

l. said first head assembly having an upper extremity including a step member and a retaining plate member which is disposed above and separated from the step member;

m. said upper portion of said first head assembly accommodating a cutting member in the space between said step member and said retaining plate;

n. said cutting member being secured within said first head assembly by means of a set screw extending through said retaining plate to tighten it against said cutting member and said step member;

o. said first head assembly further having a circular boss extending from the inner area of its lower surface;

p. said first head assembly further having a threaded stud extending from the central area of its lower surface; and

q. said first head assembly being retained on the head end of said elongated body member such that said ribs of said first head assembly are interengaged with said ribs of said body portion, said boss is accommodated within said first circular recess, said first head assembly is accommodated within said arcuate recess of said body member at one portion and disposed such that said cutting member extends outwardly away from said body portion, and said first head assembly is retained within said head portion by extending said threaded stud through said first and said second recess and said central bore and tightening said first head assembly by means of a nut threaded onto said stud and thightened so as to be accommodated within said third recess;

r. whereby the entire first head assembly may be rotated to any desired degree relative to the body member by loosening said nut, disengaging said two sets of ribs, rotating the first head assembly by the desired amount, re-engaging said two sets of ribs, and then retightening said nut, and further said cutting member may be adjusted or replaced without moving said first head assembly by loosing said set screw to loosen said retaining plate, adjusting or replacing said cutting member, and then tightening said set screw to force said retaining plate against said cutting member.

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**4,389,145**

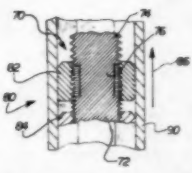
## METHOD OF TAPPING DUAL THREAD FASTENERS

**Terry D. Capuano, Hinckley, Ohio, assignor to Russell, Burdsall & Ward Corporation, Mentor, Ohio**

**Filed Aug. 31, 1981, Ser. No. 297,777**

**Int. Cl.³ B23G** *1/16, 5/06;* **B21D** *53/24*

**U.S. Cl. 408—1 R** **14 Claims**

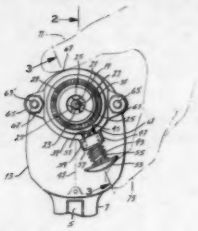



1. A method of forming an internally threaded fastener having coincident coarse and fine thread convolutions with intermingled turns, said method comprising the steps of providing a body having an axially extending opening, providing a single tap having a first section for forming a thread convolution with a first pitch and a second section axially aligned with the first section for forming a thread convolution with a second pitch which is different than the first pitch, tapping in the side wall of the opening with the first section of the tap a first internal thread convolution having the first pitch by effecting axial movement between the tap and the body, and thereafter tapping in the side wall of the opening a second internal thread convolution of the second pitch coincident with the first thread convolution and having turns intermingled with turns of the first thread convolution, said step of tapping a second thread convolution being performed with the second section of the single tap by continuing the axial movement between the tap and the body.

## 4,389,146
## AUTOMATICALLY-DRIVEN CHUCK ACCESSORY FOR HAND DRILL

James D. Coder, 701 W. Lincoln St., Belleville, Ill. 62223

Continuation of Ser. No. 14,847, Feb. 26, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,523
Int. Cl.³ B23B 31/06, 45/02
U.S. Cl. 408—240 2 Claims

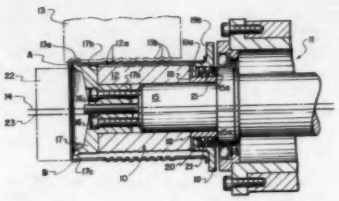


1. An accessory for use with a drill-type tool having a housing and a chuck extending outwardly from said housing for facilitating chuck engagement and disengagement of a drill bit shank or the like, said chuck being rotatingly drivable in selectively reversible directions by said tool and having a sleeve including a recess therein, said sleeve being rotatable axially about said chuck for tightening and loosening of said chuck, said accessory comprising a collar having flanges on opposite sides, said flanges having apertures for receiving means structurally retaining said housing upon said tool for securing said collar to said housing in chuck-surrounding relationship, said collar carrying a locking pin carrying a manipulating button, said pin being in chuck confronting orientation in alignment with said chuck sleeve recess for radial shifting movement toward and away from said chuck sleeve recess perpendicular to the axis of rotation of said chuck, said collar having a bore, said pin being set within said bore, a spring interengaging said collar and said button for resiliently biasing said pin radially outward from said chuck toward a first position disengaged from said chuck, means for retaining said pin in said bore of said collar, said button being carried by said pin and manipulatively engageable for shifting said pin radially inwardly toward said chuck toward a second position of engagement with said chuck sleeve recess for locking said sleeve relative to said collar to prevent rotation of said sleeve with respect to said housing, said pin extending radially outwardly from said collar in downward angular offset relationship to said housing wherein said pin has a longitudinal axis along which said pin is radially shiftable, said tool having a handle including a squeezable trigger switch extending downwardly from said housing, said plane of lateral symmetry transecting said handle, the longitudinal axis of said pin forming an angle with said plane of lateral symmetry, and thereby with said handle, of about 25°, for presenting said button for manipulative engagement and radially inward shifting by pinching action of one hand of the user upon tactile interengagement of said button and collar by the user's fingers in opposed relationship while the other hand of the user grasps said handle, whereby said pinching action is carried out by the user while simultaneously grasping said handle and squeezing said trigger, physiologically natural grasping orientation of the user's hands and fingers, operation of said tool upon simultaneous pinching action and squeezing of said trigger switch providing rotation of said chuck in one direction or the reversed direction for respective tightening or loosening of said chuck.

## 4,389,147
## CAN SUPPORT SYSTEM

Earl R. Van Alsburg, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 8, 1980, Ser. No. 213,925
Int. Cl.³ B21D 51/26
U.S. Cl. 413—69 8 Claims



1. A method for holding a hollow generally cylindrical tubular body over a mandrel in a prescribed axial relationship to said mandrel during a forming operation in which the side wall of said body is beaded including the following steps:

inserting said tubular body over a mandrel by coaxially aligning said body and said mandrel and camming said body on to said mandrel,

engaging the innermost end of said body opposite to the camming end and urging same outwardly relative to said mandrel for locating at a prescribed distance the cammed body end with respect to the outward end of said mandrel adjacent said camming device, and

radially reforming the side wall of said body to include a series of annular convolutions including a chime-like one positioned near the cammed end of said body said chime-like convolution being a preset distance from the bottom of said body.

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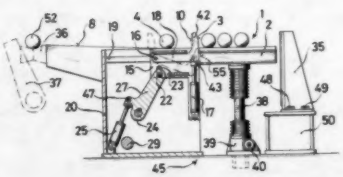
## 4,389,148
## APPARATUS FOR BUNDLING ELONGATED WORKPIECES

Horst Lorenz, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, GmbH & Co. KG, Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 895,358, Apr. 11, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,974
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716215
Int. Cl.³ B65G 57/10
U.S. Cl. 414—85 8 Claims



5. Apparatus for bundling elongated metallic workpieces such as metal rods and bars comprising: a generally U-shaped trough having a vertically movable bottom wall for adjusting the depth of such trough, a movable pusher for transversely feeding workpieces toward such trough for positioning a plurality of workpieces in side-by-side relationship to form a row, a slope structure downwardly inclined toward such pusher, horizontally movable support rails selectively movable be-

tween a position extending across said trough spaced above said movable bottom wherein a new row of workpieces is positionable on said rails in a position displaced from said trough and beneath said slope structure for stacking the new row of workpieces onto the row of workpieces for resting on said movable bottom wall, a movable stop adjacent the lower end of said slope structure movable between a stopping position for engaging individual workpieces one at a time moving down the slope towards such trough and a retracted position allowing movement of workpieces therebeyond into said trough by means of said pusher; wherein said pusher and stop are defined by a common member having one side forming said stop for engaging the workpiece along its axis of elongation opposite to the direction of movement of the workpieces on the slope structure and an opposite side of the common member forming said pusher for engaging and moving the workpiece about its axis of elongation in the same direction as the workpiece moves on the slope structure and a side wall surface for said trough and movably mounted for being raised and lowered into and out of the path of the workpiece adjacent to the terminal end of the inclined slope structure; and movable means effective to establish relative movement between said rails and said common member.

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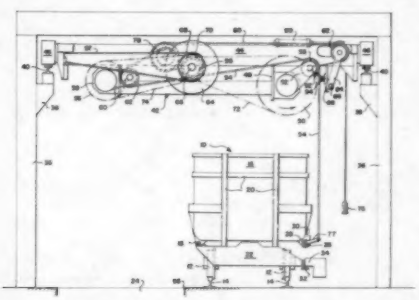
**4,389,149**

## APPARATUS FOR DUMPING A TOP-DUMPING MINE CAR

**Tibor Dancs, Aurora, Colo., assignor to Gulf Oil Corporation, Pittsburgh, Pa.**

**Filed Jul. 27, 1981, Ser. No. 287,079**
**Int. Cl.³ B65G** *67/30, 67/42*
**U.S. Cl. 414—382** **7 Claims**



**3.** In apparatus for unloading a top-unloading, pivotally mounted mine car, the improvement comprising:

(1) a hoist chain having means at one end for connection to the mine car;

(2) a positioning crank arm having a positioning pulley connected to one end thereof spaced from the axis of rotation of the crank arm whereby the positioning pulley moves laterally on rotation of the positioning crank arm;

(3) a drive crank arm having a drive pulley mounted on one end thereof remote from the axis of rotation of the drive crank arm, said hoist chain extending from the mine car connection means over the positioning pulley and onto the pulley on the drive crank arm and then to a point of attachment that limits movement of the hoist chain; and

(4) driving means connected to the crank arms constructed and arranged to rotate the drive crank arm at twice the angular velocity of the positioning crank arm whereby movement of the pulley on the drive crank arm varies the effective length of the hoist chain and movement of the positioning pulley on rotation of the positioning crank arm maintains the point of support of the hoist chain ahead of the connection of the hoist chain to the mine car as the hoist chain lifts the connection to the mine car.

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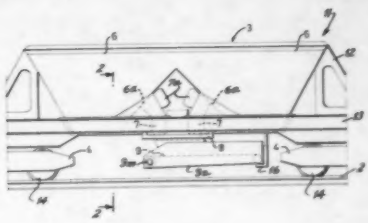
**4,389,150**

## APPARATUS FOR MOVABLY SPREADING MATERIAL ON A RAILROAD EMBANKMENT

**Rune Stenlund, Askersund, Sweden, assignor to AB Vretstorp-Verken, Vretstorp, Sweden**

**Continuation-in-part of Ser. No. 870,366, Jan. 18, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,821**
**Claims priority, application Sweden, Jan. 25, 1977, 7700700**
**Int. Cl.³ B60P** *1/36, 1/58*
**U.S. Cl. 414—505** **8 Claims**



**1.** A railway vehicle for discharging a strand of material while moving on railroad tracks, comprising:

(a) first and second funnel troughs for retaining the material;

(b) housing and support means for supporting the first and second troughs on the railroad tracks;

(c) dispensing means for controlling the flow of and dispensing said material in a strand spaced apart from said railroad tracks;

(d) said dispensing means comprising an endless belt conveyor attached to said housing and support means for conveying the material to a discharge opening;

(e) said dispensing means further comprising vibratory feeding means operated at a pre-determined vibratory frequency and located below each of said first and second funnel troughs and connected to said housing and support means, said troughs each having an aperture therein for supplying the material to said vibratory feeding means;

(f) a central funnel attached to said housing and support means, said central funnel located between each of the vibratory feeding means corresponding to the apertures in the first and second troughs and the conveyor means for supplying the material from said first and second troughs via said vibratory feeding means to said conveyor; and

(g) a means to adjust the rate of discharge of the material for a selected control setting by changing the speed of the conveyor and the vibratory frequency of the vibratory feeding means in accordance with the velocity of the railway vehicle on the railroad tracks, thereby spreading the material uniformly, despite changes in the velocity of the railway vehicle, whereby

said conveyor belt cooperates with said vibratory feeding means to control the discharge of said materials.

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**4,389,151**

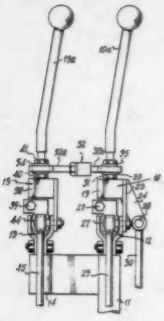
## CONTROL LEVER ARRANGEMENT

**David J. Brown, Manchester, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles**

**PCT No. PCT/GB80/00225, § 371 Date Sep. 8, 1981, § 102(e) Date Sep. 8, 1981, PCT Pub. No. WO81/02209, PCT Pub. Date Aug. 6, 1981**
**PCT Filed Dec. 29, 1980, Ser. No. 302,482**
**Claims priority, application United Kingdom, Jan. 26, 1980, 8002724; May 27, 1980, 8017209**
**Int. Cl.³ G05G** *13/00*
**U.S. Cl. 414—685** **10 Claims**

**1.** A twin control lever arrangement for the control of three functions characterised by comprising a first control lever (10) mounted on a first mounting means (12) for pivoting about first (A) and second (B) perpendicular axes to operate first and

second functions respectively, a second control lever (13) mounted on a second mounting means (15) for pivoting about a third axis (C) aligned with said first axis (A) and a fourth axis (D) parallel to said second axis (B), pivoting of said second lever (13) about said third axis (C) operating said third function, and a link member (32) extending generally perpendicularly to the two control levers (10, 13) to operatively connect said levers by way of pivotal connections (33, 34) at both ends of the link member, whereby the two levers pivot together



about said second (B) and fourth (D) axes to allow either lever to operate said second function but said first lever (10) can pivot about said first axis (A) to operate said first function without causing sufficient movement of said second lever (13) about said third axis (C) to operate said third function and said second lever (13) can pivot about said third axis (C) to operate said third function without causing sufficient movement of the said first lever (10) about said first axis (A) to operate said first function.

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**4,389,152**

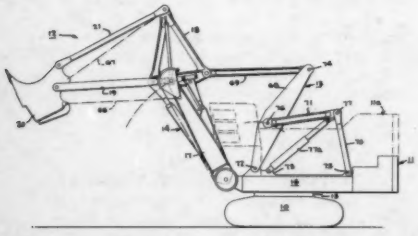
## STIFFLEG CONSTRUCTION FOR POWER SHOVELS

**Michael M. Palm, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.**

**Continuation of Ser. No. 186,850, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 950,006, Oct. 5, 1978, abandoned. This application Aug. 31, 1981, Ser. No. 297,989**

**Int. Cl.³ B66C *23/00*; E02 *3/62***

**U.S. Cl. 414—694** **7 Claims**



1. In a power shovel comprising a support unit, a stiffleg pivotally connected to said support unit, a dipper handle pivotally connected to the stiffleg, a dipper mounted on the dipper handle and means for, respectively, crowding, retracting and hoisting the dipper, an improved stiffleg construction requiring no resilient joints, but substantially eliminating the transmission of torsional loads to said support unit, and without the use of a plurality of cross-pieces, comprising:

a pair of transversely spaced, longitudinally disposed side beams, each having an I-shaped cross-sectional configuration including upper and lower flange portions and an interconnecting web portion,

a unitary web section interconnecting the web portions of said side beams,

a cross-piece section interconnecting said side beam sections at ends thereof adjacent the point at which said stiffleg is pivotally connected to said support unit to thereby form said stiffleg into a U-shaped member,

bracket means connected to said cross-piece section for pivotally connecting said stiffleg to said support unit and means for pivotally connecting said dipper handle to said stiffleg.

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**4,389,153**

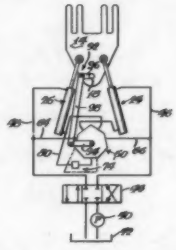
## BACKHOE SWING MECHANISM

**Carl O. Pedersen, and Herman J. Maurer, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.**

**Filed Dec. 10, 1981, Ser. No. 329,348**

**Int. Cl.³ E02F *3/32*; F15B *15/04***

**U.S. Cl. 414—695.5** **17 Claims**



1. In an implement having a frame attached to a tractor having a hydraulic system, and a swing tower pivotally connected to said frame about a vertical pivot axis and supporting a boom, an arrangement for pivoting said swing tower and said boom about said vertical axis through an arc of travel, comprising:

(a) two hydraulic motors pivotally interconnected between the frame and the swing tower, each of said motors having a cylinder end and a piston rod end, the extension and contraction of said motors pivoting said swing tower about its vertical pivot axis on the frame, each of said motors being fully extended when its respective centerline intersects said vertical axis;

(b) a hydraulic circuit connected to each motor by conduit means;

(c) directional flow control means, operatively connected to said conduit means, for selectively directing fluid under pressure from said hydraulic system to said two hydraulic motors;

(d) restricting means in said hydraulic circuit for restricting fluid flow from both of said motors during movement of said swing tower and said boom through end portions of their arc of travel prior to reaching the end of the arc, including rotary sequencing valve means hydraulically joined to said motors, said flow control means, and said restricting means,

said sequencing valve means being operatively associated with the pivotal position of said swing tower whereby when said flow control means direct fluid to pressurize the piston rod end of one of said motors in pivoting said swing tower through said arc, said sequencing valve means sequentially provides fluid communication between:

said one piston rod end and both the cylinder ends across said restricting means;

said one piston rod end and the cylinder end of the other motor, and between the cylinder end of the one motor and the piston rod end of the other motor; and

both the cylinder ends and the piston rod end of the other motor across said restricting means.

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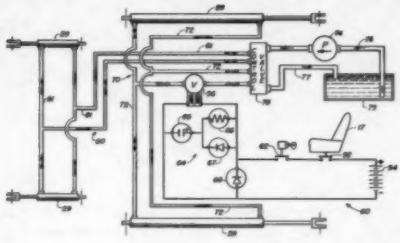
4,389,154

## TIME DELAY FOR A SEAT SWITCH ACTIVATED LOADER BOOM LOCK

Ray C. Minor, Leola; James W. Treichler, Lancaster, and Carl E. Bohman, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed May 13, 1981, Ser. No. 263,327
Int. Cl.³ B60K 27/08
U.S. Cl. 414—699 6 Claims



1. In a loader having a mobile frame including upwardly extending, laterally spaced side members; a boom structure pivotally mounted on said frame and moveable in a generally vertical path direction, said boom structure including a pair of boom arms generally vertically moveable along a path adjacent said sidewalls; first power means operatively associated with said boom structure for moving said arms along said path of movement; and an operator's compartment positioned between said sidewalls, the improvement comprising:

power interruption means operatively associated with said power means to selectively render said power means inoperative to vertically move said boom structure;

control means operatively connected to said power interruption means for selectively controlling the operation thereof to render said power means inoperative to vertically move said boom structure, said control means including an electrical circuit having a first switch manually moveable between an on position and an off position and a second switch operatively positioned to sense the presence of an operator within said operator's compartment, said second switch being positioned in an on position when an operator is sensed within said operator's compartment and in an off position when an operator is not sensed within said operator's compartment, said electrical circuit being connected to an energy source to provide energy to control said power interruption means, said power interruption means rendering said power means inoperative when either of said first and second switches are positioned in the off position; and

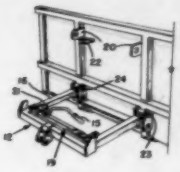
time delay means operatively associated with said control means to prevent said power interruption means from rendering said power means inoperative for a predetermined period of time after said second switch becomes positioned in said off position, said time delay means including a capacitor connected to said electrical circuit in parallel with said energy source, a first diode connected to said electrical circuit in series with said capacitor and in parallel with a resistor, said capacitor providing a temporary source of electrical current to said power interruption means after said second switch has been moved to said off position, said first diode permitting the flow of current from said energy source to charge said capacitor and requiring the flow of current from said capacitor to flow to said power interruption means through said resistor.

4,389,155

## TRACTOR SCOOP MECHANISM

Charles A. Absher, Rte. 1, Box 210-B, Traphill, N.C. 28685

Filed May 11, 1981, Ser. No. 262,125
Int. Cl.³ E02F 3/82
U.S. Cl. 414—723 7 Claims



1. A tractor scoop mechanism comprising: a frame member for pivotable attachment to a scoop device, a pin assembly for engagement with and disengagement from said scoop device, said pin assembly mounted on said frame member, a handle means, said handle means affixed to said pin assembly, said pin assembly having a telescoping portion having inner and outer sections, said outer section containing a resilient member, said inner section and said outer section each having a pin member whereby said telescoping portion is in a collapsed configuration when said pin assembly is in a disengaged position.

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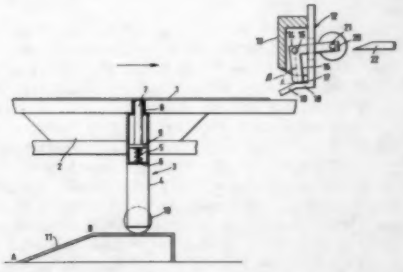
4,389,156

## DEVICE FOR LIFTING, GRIPPING AND TRANSPORTING PRINTING PLATES

Werner Dennhardt, Taunusstein, and Hans Heist, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,286
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033706
Int. Cl.³ G03G 21/00; B65H 5/04
U.S. Cl. 414—753 9 Claims



1. A device for lifting, gripping and transporting printing plates in a processing apparatus of the type in which the printing plates are fixed by suction on a processing table during processing at individual stations of the apparatus, said device comprising:

means, positioned below the processing table, for lifting a printing plate positioned on the table, said lifting means being movable in the longitudinal direction of the apparatus and comprising a lifting member having a height (h), and means, including a spring member having a compressive force insufficient to lift off of the processing table a printing plate fixed by suction but sufficient to lift the printing plate when the suction is released, for shortening said lifting member to a height less than (h) under compression of said spring member in response to movement

of said lifting means in the direction of transport of the printing plate; and

a gripping member positioned above the processing table for gripping a printing plate lifted off of the processing table by said lifting means.

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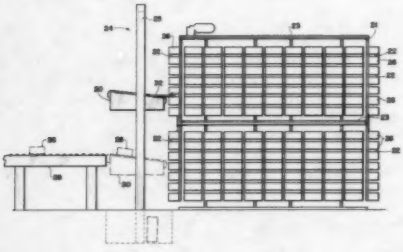
**4,389,157**

## RETRIEVAL AND STORAGE MECHANISM FOR USE WITH AN AUTOMATED ROTATING STORAGE UNIT

**Clay Bernard, II, Point Richmond, Calif.; William F. Matheny, III, Tulsa, Okla.; Charles M. Faith, Broken Arrow, Okla.; Richard L. Goswick, Tulsa, Okla., and Jerry L. Hauth, Broken Arrow, Okla., assignors to SPS Technologies, Inc., Jenkintown, Pa.**

**Filed Jul. 9, 1981, Ser. No. 281,841**
**Int. Cl.³ B65G** *1/06*
**U.S. Cl. 414—787** **11 Claims**



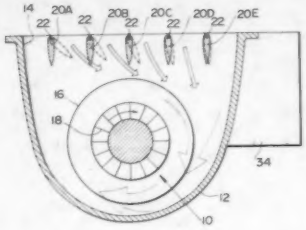
1. In combination with automatic storage and retrieval system having a continuous track and a continuous rotating storage unit supported from said track and movable therearound in a horizontal direction, wherein said rotating storage unit includes a plurality of horizontally spaced shelves arranged vertically into columns, each shelf being adapted to accommodate a storage bin thereon, a coveyor system mounted adjacent said rotating storage unit for moving storage bins towards and away from said rotating storage unit, and an elevator mounted in a fixed position between said rotating storage unit and said conveyor system; the improvement which comprises a platform mounted in said elevator for vertical movement up and down adjacent said rotating storage unit, an extraction and insertion arm assembly slidably mounted on said platform, said arm assembly including a pair of longitudinally disposed extractor arms having forward ends extending towards said rotating storage unit, a driving means for moving said arm assembly in a horizontal direction towards and away from said rotating storage unit for bin placement in and withdrawal from a preselected shelf, a spring loaded bin engaging means mounted on the forward end of each arm for removing a bin from a preselected shelf during an extraction operation, a seating means mounted on the upper portion of each said arm for pushing a bin onto a preselected shelf during an insertion operation, a conveyor belt assembly mounted on said platform in longitudinal alignment therewith between the extractor arms for aiding the movement of a bin into or withdrawal from a preselected shelf, and a retaining means for securing a bin on said platform.

**4,389,158**

## TURBO COMPRESSOR HAVING A SURGE SUPPRESSING ARRANGEMENT

**Keiichi Nakanishi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed May 20, 1981, Ser. No. 265,329**
**Claims priority, application Japan, Jun. 6, 1980, 55-75440**
**Int. Cl.³ F01B** *25/02, 25/04, 25/06*
**U.S. Cl. 415—148** **8 Claims**




1. In a turbo compressor having a compressor wheel disposed in an induction housing and an induction port which lies in an essentially flat plane non-intersecting with the axis of rotation of said compressor wheel, the combination of:

a plurality of spaced normally parallel vanes disposed across said induction port; and

a control mechanism which moves each of said vanes through an angle different from the other, said mechanism being activated in response to said compressor tending to surge so that the air is swirled in said induction housing upstream of said compressor wheel and impinges on said compressor wheel with a uniform and reduced angle of incidence.

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**4,389,159**

## CENTRIFUGAL PUMP

**Hannu Sarvanne, Vantaa, Finland, assignor to Oy E. Sarlin AB, Helsinki, Finland**

**Filed Nov. 25, 1980, Ser. No. 210,361**
**Claims priority, application Finland, Nov. 29, 1979, 793738**
**Int. Cl.³ F04D** *17/08, 29/46*
**U.S. Cl. 415—219 A** **2 Claims**

1. A centrifugal pump with a housing which has circular shape in the direction of the circumference and which has on its circumference an exit tube commencing at an exit port substantially tangential with reference to the flow, where the length of the exit port in the direction of the housing circumference is about $\pi/4$ times the inner radius of said housing and where the outer wall of the exit tube constitutes a diverging bulge on outward transition from the circumference, and wherein the outer wall of the exit tube, projecting under an angle about 45 degrees from the circumference of the housing, consists of an arc having the centre of its radius approximately at the juncture of the opposite wall of the exit tube and the housing circumference.

**4,389,160**

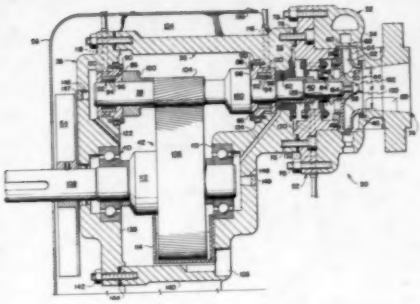
## HIGH SPEED CENTRIFUGAL PUMP AND METHOD FOR OPERATING SAME AT REDUCED NOISE LEVELS

**Hasan F. Onal, Denver, Colo., assignor to Edison International, Inc., Rolling Meadows, Ill.**

**Division of Ser. No. 9,472, Feb. 2, 1979, abandoned. This application Sep. 25, 1980, Ser. No. 190,754**

**Int. Cl.³ F01D** *5/08, 5/02*

**U.S. Cl. 415—206** **2 Claims**



1. A single stage, single suction, high speed centrifugal pump comprising:

(a) a pump housing, said housing including a double volute portion,

(b) a bearing housing,

(c) a shaft mounted for rotation within said bearing housing with a portion of said shaft extending into said pump housing,

(d) means for rotating said shaft about an axis, said rotating means including a single-step helical gear arrangement,

(e) a closed Francis-vane impeller mounted on said portion of the shaft extending into said pump housing for rotation therewith about the rotational axis of the shaft, said impeller having:

(i) an inlet eye having an inlet diameter,

(ii) a longitudinally extending hub portion and a radially extending vane support portion having an outer discharge diameter,

(iii) a plurality of vanes fixed to said vane support portion, said vanes spiraling outwardly to the outer periphery of said vane support portion and having leading and trailing edges and lead and trail angles,

(iv) an annular shroud fixed to said vanes,

(v) the lead angle of each leading edge of said vanes being about 6°40′ at said shroud and varying continuously to about 8° at said vane support portion,

(vi) the trail angle of each vane being about 16° to the trailing edge thereof,

(vii) each of said vanes having an angular extent of approximately 210° about the rotational axis of the impeller, and

(viii) each of said vanes being equally spaced peripherally about said impeller

(f) said double volute portion of said pump housing being mounted about said impeller to receive the discharge therefrom and having an inlet flow passage means with a portion thereof axially aligned and in fluid communication with the eye of the impeller,

(g) the ratio of the outer discharge diameter of said vane support portion to the inlet diameter of said impeller eye being at least approximately two, and

(h) means for controlling axial thrust along said shaft, said controlling means including:

(i) a pair of wear rings of predetermined diameter relative to each other formed between the pump housing and said impeller for separating the inlet pressure from the discharge pressure, and

(ii) at least one opening formed through said impeller,

wherein said bearing housing includes a plurality of fins mounted thereon and extending outwardly of said bearing housing.

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**4,389,161**

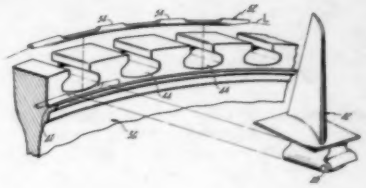
## LOCKING OF ROTOR BLADES ON A ROTOR DISK

**Claudio Brunen, Denver, Colo., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 19, 1980, Ser. No. 218,241**

**Int. Cl.³ F01D** *5/32*

**U.S. Cl. 416—220 R** **3 Claims**



2. In an axial flow rotary machine of the type having a rotor assembly which includes a disk having slots extending in a generally axial direction, each slot adapting the disk to receive a corresponding rotor blade, the improvement which comprises:

a rotor disk having a groove extending in a generally circumferential direction and facing in a generally outward direction;

at least two rotor blades each having a root, each root having a groove extending in a generally circumferential direction, facing and in axial and radial alignment with the groove in the disk;

at least one scalloped lock pin for engaging both the rotor disk and at least two rotor blades, each lock pin extending circumferentially in the disk groove to engage the disk and having radial lugs, each lug extending radially into the corresponding groove in the root of a corresponding blade to trap the rotor blade against fore and aft movement with respect to the disk, at least one pair of adjacent lugs being spaced one from the other a sufficient distance apart to permit passage of the blades therethrough.

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**4,389,162**

## ROTOR BLADE COMPRISING A PLURALITY OF INDIVIDUAL SECTIONS

**Rolf Doellinger, Fischbachau; Rudolf Schiadler, Ottobrunn, and Dieter Franz, Jettenbach, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany**

**Filed May 13, 1980, Ser. No. 149,523**

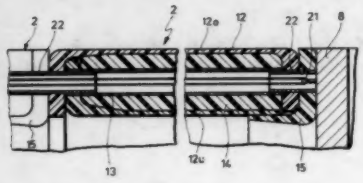
**Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921152**

**Int. Cl.³ F03D** *1/06*

**U.S. Cl. 416—225** **13 Claims**

1. A large scale rotor blade having a longitudinal, radially extending axis, comprising a plurality of individual blade sections (2) forming pressure bodies extending in the longitudinal, radial direction of the rotor blade axis, each blade section having an end surface which forms an interface with an end surface of the adjacent blade section in an end to end fitting relationship, tensioning means (16) extending longitudinally relative to said individual sections for providing a pulling force which holds the individual sections together, anchoring means (20, 21) securing both ends of said tensioning means, said anchoring means and adjacent blade sections providing an exclusively form-fit connection between adjacent blade sections (2),

adjustment means (17, 18) operatively connected to one end of said tensioning means for adjusting said pulling force applied by said tensioning means to operatively hold all individual sections of the rotor blade together, whereby said individual sections may be assembled to form large blades, said rotor




blade further comprising a plurality of bushings (22) extending through each interface to form locking means (22) which together prevent any rotation of said blade sections (2) relative to one another about said rotor blade axis, and wherein said tensioning means (16) extend through said bushings (22) at a small, acute angle relative to the longitudinal rotor blade axis.

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**4,389,163**

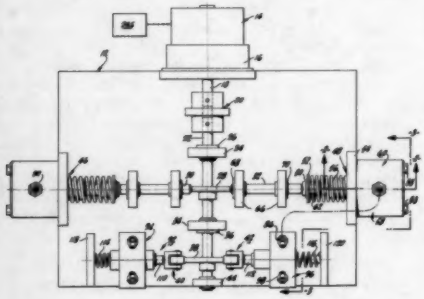
## PRESSURE BOOSTER SYSTEM FOR FLUIDS

**Haakon T. Magnussen, Jr., Pinole, and Stephen J. Ruskewicz, Kensington, both of Calif., assignors to Altex Scientific, Inc., Berkeley, Calif.**

**Continuation of Ser. No. 425, Jan. 2, 1979, abandoned. This application Jun. 19, 1981, Ser. No. 275,556**

**Int. Cl.³ F04B** *41/02, 49/06, 49/00, 3/00*

**U.S. Cl. 417—2** **17 Claims**



1. A pressure booster system for fluids comprising:

a. injector means for delivering a selected relatively low pressure output flow of fluid;

b. means for accumulating fluid mass from said relatively low pressure injector means, said accumulating means having an output flow;

c. means for detecting a fluid mass in said fluid mass accumulating means relative to a selected value of fluid mass capable of being confined therein, said detecting means producing a signal representative of said fluid mass in said fluid mass accumulating means;

d. high pressure pump means for receiving as its input the outlet flow of fluid from said accumulating means and for producing a high pressure output flow of fluid; and

e. control means for regulating the flow rate of said relatively high pressure pump means according to said fluid mass signal received from said detecting means, said control means comparing said detecting means signal to a reference signal proportionate to said selected value of fluid mass.

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**4,389,164**

## AUTOMATIC LIQUID LEVEL CONTROLLER

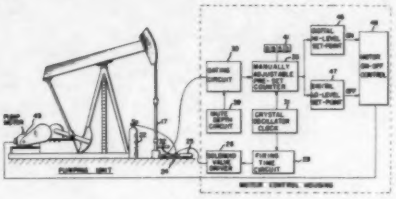
**John K. Godbey, Dallas, and Billy G. Ballard, Garland, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 822,506, Aug. 8, 1977, Pat. No. 4,318,674, which is a continuation-in-part of Ser. No. 749,940, Dec. 13, 1976, abandoned, which is a continuation of Ser. No. 563,249, Mar. 28, 1975, abandoned. This application Jun. 24, 1981, Ser. No. 278,437**

**The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.**

**Int. Cl.³ F04B** *49/06*

**U.S. Cl. 417—36** **3 Claims**



1. Apparatus for controlling a pump suspended in a well comprising:

a source of periodic acoustic pulses continuously coupled to said well;

a transducer coupled to said well producing an output in response to the occurrence of acoustic pulses in said well and in response to the detection of the acoustic pulse reflected from the liquid surface in said well;

a clock pulse source;

digital counting means;

gating means responsive to the output of said transducer for starting the counting of clock pulses by said digital counting means upon the occurrence of an acoustic pulse in said well and for stopping said counting upon detection of the acoustic pulse reflected from the liquid surface in said well; and

a digital controller responsive to said digital counting means for controlling said pump, said digital controller including:

a high level set-point circuit including a manually settable digital register calibrated in units of depth;

a low level set-point circuit including a manually settable digital register calibrated in units of depth; and

a comparator, said digital registers and said counting means being connected to said comparator, said comparator being connected to turn said pump on in response to counting clock pulses between said periodic acoustic pulses and said detection of the acoustic pulse reflected from the liquid surface when the liquid in said well exceeds the high set-point level and to turn said pump off in response to counting clock pulses between said periodic acoustic pulses and said detection of the acoustic pulse reflected from the liquid surface when the liquid in said well falls below the low set-point level.

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**4,389,165**

## ION PUMP FOR PRODUCING AN ULTRAHIGH DEGREE OF VACUUM

**Shoichi Ono, and Kuniyoshi Yokoo, both of Sendai, Japan, assignors to Tohoku University, Sendai, Japan**

**Filed Sep. 26, 1980, Ser. No. 190,913**

**Claims priority, application Japan, Sep. 29, 1979, 54-124716**

**Int. Cl.³ F04B** *37/02*

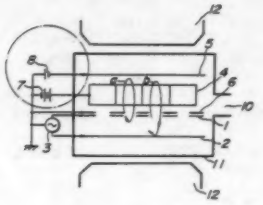
**U.S. Cl. 417—49** **7 Claims**

1. An ion pump for producing an ultrahigh degree of vacuum comprising:

an evacuating chamber disposed in a magnetic field,

a first perforated multipactor electrode and a second multipactor electrode opposed to each other to form a multipactor space therebetween in said chamber, said electrodes having a desired secondary electron emission ratio,

a high frequency electric source connected between said first and second electrodes for generating a high frequency alternating current electric field therebetween so as to accelerate electrons produced by one of said first and second multipactor electrodes and to cause said electrons thus accelerated to collide with the other electrode to emit secondary electrons whereby a secondary electron resonance multiplication phenomenon is obtained,



an ionization space disposed adjacent to said multipactor space, said ionization space being defined by a first perforated getter electrode adapted to receive a first direct current potential and a second getter electrode adapted to receive a second direct current potential for repelling ions, said ionization space being disposed adjacent said first perforated multipactor electrode, and including therein an accelerating grid electrode for accelerating ions from said first to said second getter electrodes whereby said ionization space is operative to take in a portion of moving electrons produced in said multipactor space and to cause moving electrons to collide with and ionize gas molecules thereby to evacuate the chamber.

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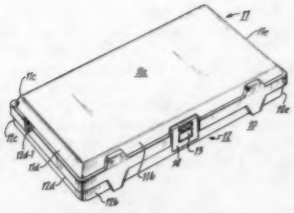
**4,389,166**

## SELF-CONTAINED PORTABLE AIR COMPRESSOR

**Gerald J. Harvey, Woodmere, and Elliot Huff, Jr., St. James, both of N.Y., assignors to Harvey-Westbury Corp., Westbury, N.Y.**

**Filed Oct. 22, 1979, Ser. No. 87,009**
**Int. Cl.³ F04B *35/04***
**U.S. Cl. 417—234** **11 Claims**



1. A portable unitary air compressor unit comprising:

a compressor;

a motor;

a common bracket;

gear means for coupling the output of said motor to said compressor;

said motor, said compressor and said gear means being secured to said common bracket;

a power cord for coupling said motor to a power source;

an air hose for coupling said compressor to an inflatable object;

substantially impact proof housing means for enclosing said motor, common bracket, compressor, air hose and power cord, said housing means comprising a lid hingedly connected to a tray movable between an open and a closed position;

said tray including a molded sheet having a first cavity for receiving and supporting said motor, said common bracket and said compressor and a second cavity for storing said air hose and said power cord when not in use;

first and second guideways in said molded sheet for respectively receiving and guiding a portion of said power cord and a portion of said air hose for enabling coupling of said air hose to an inflatable object and coupling of said power cord to a power source when said lid is closed upon said tray whereby said housing completely encloses said compressor, said motor and said gear means when the motor and compressor are in operation to prevent said motor and compressor from being damaged and to facilitate safe movement and handling of said motor and compressor even when energized.

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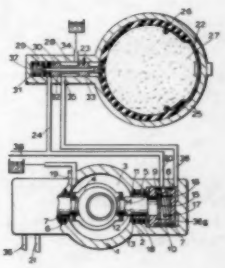
**4,389,167**

## PUMP HAVING MEMBRANE ACTUATED CONTROL VALVE TO UNLOAD SLAVE ACTUATED INLET VALVE

**Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Nov. 6, 1980, Ser. No. 204,584**
**Int. Cl.³ F04B *49/02, 49/08;* F16D *31/02***
**U.S. Cl. 417—289** **9 Claims**



1. An hydraulic system comprising an hydraulic pump having an inlet for connection to a tank for fluid, an hydraulic accumulator, a supply-line between said pump and said accumulator, and an unloader valve disposed in said supply line to limit the pressure which can be stored in said accumulator, said unloader valve incorporating a control valve, and a pressure-respondive slave operated by fluid pressure under control of said control valve, said pressure-responsive slave having a pressure-responsive face and being provided with means defining a flow-path between said pump and said accumulator, said control valve comprising a valve member movable between a first position in which said accumulator is isolated from said pressure-responsive face of said slave, and a second position in which fluid pressure from said accumulator acts on said pressure-responsive face of said slave to render said slave operative to unload said pump, and said accumulator incorporating a container, and a membrane in said container to trap a volume of gas under pressure in said container and separate said gas from fluid from said pump, said membrane itself also co-operating with said valve member to provide a force for controlling movement of said valve member between said first and second positions in accordance with said pressure in said accumulator.

**4,389,168**

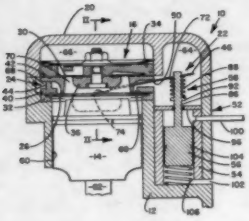
## APPARATUS FOR MODULATING THE CAPACITY OF A RECIPROCATING COMPRESSOR

**Donald Yannascoli, Fayetteville, and Bruce A. Fraser, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Mar. 27, 1981, Ser. No. 248,388**

**Int. Cl.³ F04B** *49/00;* **F25B** *1/00*

**U.S. Cl. 417—298** **4 Claims**



1. Apparatus for modulating the capacity of a reciprocating compressor having a cylinder chamber and a valve assembly extending over the cylinder chamber, the valve assembly defining fluid inlet and outlet paths and including a suction valve having an annular plate for regulating fluid flow through the inlet path, the capacity modulating apparatus comprising:

a lever extending through the fluid inlet path and above the suction valve, and including

a shoulder extending radially outside the valve assembly and having a first end located outside the valve assembly, and

a second end engaging the suction valve and having first and second, spaced arms extending from the shoulder and engaging opposed, top sides of the annular plate,

a fulcrum engaging the shoulder of the lever; and

control means engaging the shoulder of the lever for applying a variable force thereto, wherein the lever transmits the force to the suction valve to urge the suction valve to an open position.

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**4,389,169**

## PUMP FOR FLUIDS

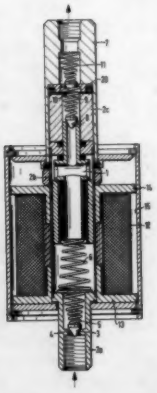
**Manlio M. De Dionigi, Olgiate Olona, Italy, assignor to Alessandro Nicoletti, Milan, Italy**

**Filed Mar. 6, 1981, Ser. No. 241,238**

**Claims priority, application Italy, Mar. 10, 1980, 20461 A/80**

**Int. Cl.³ F04B** *17/04*

**U.S. Cl. 417—417** **1 Claim**



1. A reciprocating electromagnetic pump comprising a trunk piston of magnetic material, reciprocable in a cylinder connected at its ends with suction and delivery ducts and enclosed in a coil energized during the piston suction stroke, wherein the piston comprises a set of cylindrical liners overlapping on one another, said cylinder comprising a suction portion, a central portion which receives said sliding piston, and a delivery portion, said central portion being fabricated from a magnetic material, the delivery portion of the cylinder comprising two parts, one of said parts being fabricated from graphite and the other of brass, with an O-ring arranged between them, said O-ring slightly protruding inside the cylinder bore portion which receives the sliding piston stem.

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**4,389,170**

## ROTARY VANE PUMP WITH PASSAGE TO THE ROTOR AND HOUSING INTERFACE

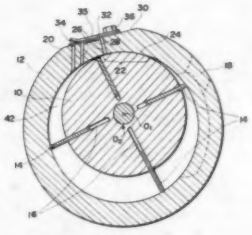
**Kazuo Hayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Nov. 14, 1980, Ser. No. 206,931**

**Claims priority, application Japan, Nov. 17, 1979, 54-159666[U]**

**Int. Cl.³ F01C** *1/00, 21/04;* **F04C** *29/02*

**U.S. Cl. 418—15** **5 Claims**



1. A rotary vane pump comprising:

a rotor disposed in a housing;

vanes slidably received in said rotor for contacting the inner surface of said housing;

an arcuate contact surface formed in said housing, said contact surface having a radius equal to the radius of said rotor, said rotor being mounted within said housing so as to contact said arcuate contact surface to define an interface between said housing and said rotor which separates a high pressure discharge zone on one side thereof from an induction pressure zone on the other side thereof;

a discharge passage leading from said high pressure discharge zone through the wall of the said housing;

a valve mounting site formed on said housing;

a discrete lubricant passage leading from said high pressure zone to said interface, said lubricant passage having an open channel section formed in said site;

a valve mounted on said site, said valve having an element for closing said channel; and

a projection on said valve which extends into said lubricant passage for throttling the same in dependence on the pressure of the fluid discharged through said discharge passage.

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**4,389,171**

## GAS COMPRESSOR OF THE SCROLL TYPE HAVING REDUCED STARTING TORQUE

**David H. Eber, and John R. Sauls, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.**

**Filed Jan. 15, 1981, Ser. No. 225,211**

**Int. Cl.³ F04C** *18/02, 29/08*

**U.S. Cl. 418—15** **8 Claims**

1. A gas compressor of the positive displacement scroll type comprising

a. a first wrap element defining inner and outer flank surfaces of generally spiroidal configuration about a first axis and extending between first and second axial tip portions;
b. a second wrap element defining inner and outer flank surfaces of generally spiroidal configuration about a second axis and extending between first and second axial tip portions, said first and second wrap elements being disposed in intermeshing, angularly offset relationship with their respective axes generally parallel;
c. end plate means comprising a first end plate sealingly affixed to the first axial tip portion of said first wrap element and a second end plate sealingly affixed to the first axial tip portion of said second wrap element, the second axial tip portions of said first and second wrap elements extending to a point in substantial sealing relationship to said second and first end plates respectively; further comprising means for maintaining said second wrap element and end plate in a fixed position;
d. drive means operative to drive said first wrap element and end plate in an orbital path with respect to said second wrap element and end plate such that moving line coaction between the inner facing flank surface of said first wrap element and the outer facing flank surface of said second wrap element, and between the outer facing flank surface of said first wrap element and the inner facing flank surface of said second wrap element, defines between said end plate means first and second moving volumes originating at a radially outer portion of said wrap elements and progressing radially inwardly to a radially inner portion thereof, said volumes being bounded initially by a single, leading moving line of coaction so as to define a suction volume; then by both leading and trailing lines of coaction so as to define a closed moving volume which is progressively reduced in volume as it moves radially inwardly; and finally by a single trailing line of coaction so as to define a discharge volume;
e. port means for admitting a working gas at a suction pressure to said suction volumes and for discharging compressed gas from said discharge volume, said discharge port means extending through said second end plate;
f. a discharge manifold disposed in generally overlying, sealed relationship with respect to said second end plate and in communication with said discharge port means, whereby said discharge manifold is normally at discharge pressure during operation of said compressor; and
g. means for reducing the degree of compression of said gas compressor as it starts from a standing start in order to reduce the initial starting torque required comprising
i. passage means comprising a first passage extending through said second end plate from a location in communication with said first closed moving volume as it progresses radially inwardly, to said discharge manifold; and a second passage extending through said second end plate from a location in communication with said second closed moving volume as it progresses radially inwardly, to said discharge manifold; each of said first and second passages having a dimension in the radial direction which is less than or equal to the thickness of said wrap elements and extending through said second end plate at a location immediately adjacent one of the flank surfaces of said second wrap element;
ii. pressure responsive valve means for permitting flow through said first and second passages when the pressure within said respective first and second moving volumes exceeds that within said discharge manifold as said compressor starts from a standing start, and for blocking flow therethrough during normal operation of said compressor, said valve means comprising first and second valve elements disposed in said respective first and second passages, said first and second valve elements having a first surface exposed to the pressure in said respective first and second closed moving volumes and a second surface exposed to the pressure within said discharge manifold; said valve elements being movable to positions permitting flow through said passages in response to a pressure within said closed moving volumes greater than that within said discharge manifold, and to positions blocking flow through said passages in response to a pressure within said discharge manifold greater than that within said closed moving volumes.

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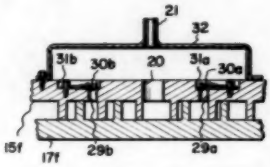
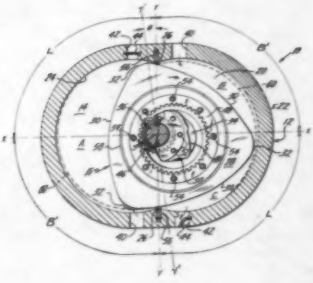
**4,389,172**

## ROTARY COMPRESSOR OR EXPANSION ENGINE OF HYPOTROCHOIDAL CONFIGURATION AND ANGULARLY DISPLACED GEAR MEANS

**Michael J. Griffith, Rutherford, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.**

**Filed Oct. 20, 1980, Ser. No. 198,583**
**Int. Cl.³ F01C** *1/22, 19/00;* **F04C** *18/22, 27/00*
**U.S. Cl. 418—61 A** **2 Claims**



1. A rotary compressor or expansion engine comprising
(a) a housing with axially spaced end walls and a peripheral wall interconnecting the end walls to form a housing cavity therebetween;
(b) a shaft having an eccentric portion supported for rotation in said housing cavity;
(c) a rotor mounted on said eccentric portion for planetative rotary movement within said housing cavity relative to said housing;
(d) said rotor having three flank surfaces intersecting each other to form a profile of hypotrochoidal configuration with rounded apex portions;
(e) said housing cavity having a peripheral surface which is substantially the outer envelope traced by the apexes of the rotor upon rotative movement of the rotor and thereby forming two juxtaposed lobe junctures dividing the housing cavity into a two lobe cavity;
(f) the rotor being sized so that the rotor and its rounded apex portions are in close running-fit with the housing to form a plurality of working chambers which expand and contract in volumetric size as the rotor rotates relative to the housing;
(g) inlet and outlet port means in said housing on opposite sides of each of the lobe junctures for passage of low and high pressure fluid into and from the working chambers

and so that in each housing cavity lobe there is a location of greatest differential fluid pressure between next adjacent working chambers;

(h) a first gear means fixedly mounted on said housing; and

(i) a second gear means mounted on said rotor for conjoined rotation with said rotor and in meshing relationship with said first gear means to provide a rotor path of substantially the same profile as the housing cavity peripheral surface but angularly displaced to provide a closer running-fit of the apex portion in each housing cavity lobe at the location of greatest differential pressure between next adjacent working chambers.

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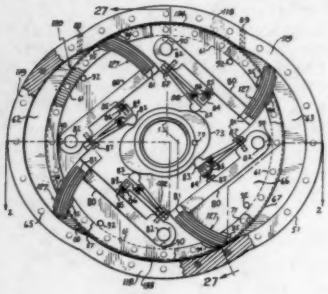
**4,389,173**

## ARCUATE PISTON ROTARY ENGINE

**William C. Kite, Kelseyville, Calif., assignor to Earl J. Lee, El Cajon, Calif.**

**Filed Apr. 1, 1982, Ser. No. 364,286**
**Int. Cl.³ F01C *1/00, 19/00;* F02B *53/00***
**U.S. Cl. 418—146** **1 Claim**



1. A rotary internal combustion engine comprising:

(a) a casing;

(b) a rotor mounted in said casing;

(c) said casing having a pair of spaced parallel endwalls perpendicular to the rotor axis and a sidewall at all points parallel to the rotor axis;

(d) said casing being oblate with end lobes defining first and second internal crescent-shaped chamber sections beyond the perimeter of said rotor, and intermediate narrow corridor-defining sectors passing close by the perimeter of said rotor and effecting communication between said chamber sectors;

(e) a plurality of circumferentially spaced outwardly biased blade pistons generally radially extended from said rotor to wipe said sidewall and defining successive sealed variable-volume gas zones therebetween;

(f) each of said zones operating through successive approximately 90° portions of its cycle to expand by drawing in gas during Phase 1 of its cycle, compressing gas during Phase 2, effecting ignition and combustion during Phase 3, and expelling exhaust gas during Phase 4 as said zones move through successive ones of said sectors;

(h) said blade pistons being arcuate and swinging on pivot arms and each being pivoted at the center of curvature of the respective piston blade;

(i) a dual cam substantially corresponding in shape to said sidewall;

(j) a cam follower extending from each of said piston pivot arms and riding on said cam;

(k) each of said cam followers having an auxiliary arm and extending from the respective piston pivot arm between the respective cam follower and pivot arm and including an adjustable bolt extending from the respective auxiliary arm to bear against the respective pivot arm, and an auxiliary spring captured between each respective auxiliary arm and cam follower such that the respective bolt bears against the respective pivot arm;

(l) said blade pistons having three bearing sides and each of same being channeled to define a composite U-shaped channel, and including a U-shaped seal seated in said channel; and

(m) said rotor comprising a pair of spaced circular plates with indexed slots cut into the edges thereof to slideably receive said blade pistons and said plates defining peripheral grooves on the outside thereof slideably seating bearing sealing strips therein to slide along the endwalls of said casing.

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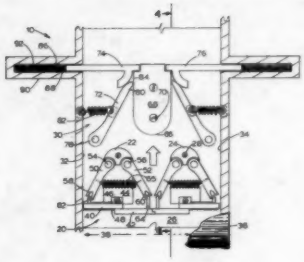
**4,389,174**

## ROTARY POWER PLANT RUNNER/SHUTTER MECHANISM

**Ching-Ho Tseng, 7307 Caracas Dr., Houston, Tex. 77083**

**Filed Jan. 5, 1981, Ser. No. 222,386**
**Int. Cl.³ F01C *1/324;* F03C *2/00***
**U.S. Cl. 418—222** **8 Claims**



1. In a rotary engine having: an axis, a housing with first and second sidewalls joined by a cylindrical outer wall concentric with said axis: a shaft, a rotor on the shaft with the rotor periphery fitting between the first and second sidewalls, in spaced relation with said cylindrical wall forming a generally annular chamber; runner structure on the rotor, means on the housing reciprocable for forming periodically in the annular chamber an expansion chamber in coaction with the runner structure, and means causing gas expansion in said expansion chamber for urging said runner structure to move the rotor in a forward rotational direction, the improvement comprising: a gate including the reciprocable means comprising first and second abutments slidable respectively in the first and second sidwalls and having respective inboard ends in opposed relation across said annular chamber, means permitting the runner structure to pass through the gate including means for retracting the first and second abutments into respective slots in the first and second sidewalls on approach of the runner structure, the runner structure including shutter structure; means causing the gate to seal across the annular chamber after passage of the runner structure through the gate, means causing the runner structure to seal across the annular chamber after the passage of the runner structure through the gate; the means for retracting including: first and second gate arms with pivotal attachment to the housing, first means engaging the first gate arm with the first abutment, second means engaging the second gate arm with the second abutment, means on the runner structure for pivoting said first and second gate arms, a gate block on the housing between the first and second abutments, provision on the gate block for supporting said inboard ends of the first and second abutments, the runner structure including a first runner located for passing on a first side of the gate block and a second runner located for passing on a second side of the gate block, and the means for pivoting the first and second gate

arms including a respective rounded front portion on each of said runners.

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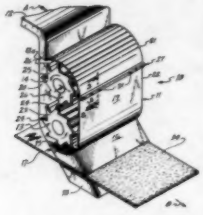
4,389,175

## APPARATUS FOR DISTRIBUTING DRY FIBERS ONTO A FORMING WIRE

Helmut W. Sakschek, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed May 15, 1981, Ser. No. 263,908
Int. Cl.³ B29J 5/00; D04H 17/00
U.S. Cl. 425—82.1 19 Claims



1. An apparatus for depositing a uniform web of dry fibers on a forming wire, comprising:

a fiber distributor housing having an inlet opening for introducing therein a gaseous dispersion of dry fibers, and a perforate outlet opening for discharging said fibers onto said forming wire;

at least a pair of rotors mounted to rotate in said housing, one rotor disposed above the other rotor, said rotors being cooperatively disposed upon rotation thereof to move said fibers about in said housing between said openings whereby to spread said fibers as they are introduced and to uniformly distribute said fibers over said perforate outlet opening for discharge therethrough onto said forming wire;

and means defining a breaker bar in said housing, adjacent one of said rotors, and being so shaped and disposed as to be impacted by clumps of fibers moved by said rotors and break them up by impaction into fibers within said housing, in accomodation of passage of said fibers through said perforate outlet opening.

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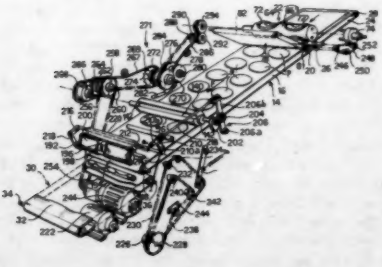
4,389,176

## MACHINE FOR THE PRODUCTION OF TUBULAR CASINGS OF ALIMENTARY DOUGH

Claudio Nenci, Via Carlo Poma 4, Cerese di Virgilio (Mantova), Italy

Filed Dec. 23, 1981, Ser. No. 334,048
Claims priority, application Italy, Mar. 20, 1981, 67386 A/81
Int. Cl.³ A01J 00/00
U.S. Cl. 425—101 18 Claims



1. A machine for the production of tubular casings of alimentary dough by rolling up pieces of sheet dough around a cylindrical support core, said machine comprising:

a support structure;

a continuous belt conveyor mounted on the support structure and having a receiving end and a discharge end,

feed means for feeding a continuous sheet of dough to the receiving end of said conveyor;

a punching device disposed above said conveyor downstream of the feed means and provided with shaped punches arranged to cut said continuous sheet of dough in synchronism with the advance of said conveyor so as to cut out successively from the said continuous sheet a series of spaced-apart pieces or groups of adjacent pieces of dough,

recovery means disposed along said conveyor downstream of said punching device and arranged to take up from the conveyor that part of the dough sheet remaining after the cutting of the said pieces;

a dispensing unit arranged above said conveyor downstream of the said recovery means and comprising a receptacle for containing cylindrical support cores, and a withdrawal member for taking out support cores from the receptacle and depositing them on said conveyor such that each said core is disposed transversely between two successive said pieces or groups of pieces of dough,

a rolling-up unit disposed transversely adjacent the discharge end of said conveyor and comprising an endless web extending upwardly with respect to the conveyor, the said endless web being supported adjacent its upper end from said support structure for back and forth movement and having a rolling-up pass which, in use, has a direction of advance from its lower end towards its upper end away from said conveyor, and actuator means for effecting in synchronism with the operation of said withdrawal member of the dispensing unit, back and forth movement of the said endless web between a substantially-vertical rolling-up position and an inclined discharge position, said endless web being operative when in its rolling-up position to entrain in rotation a said support core fed thereto by said conveyor and to cause the rolling-up thereon of a respective piece or group of pieces of dough, and

collecting means for receiving the said support cores with respective pieces or groups of pieces of dough rolled up thereon from the discharge end of said conveyor when the said endless web of the rolling-up unit is moved into its discharge position.

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4,389,177

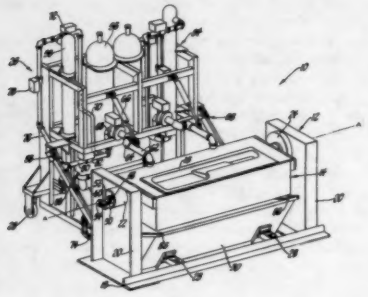
## MODULAR SLUSH MOLDING MACHINE

Daniel E. Colby, Somersworth, N.H., assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 56,866, Jul. 12, 1979, Pat. No. 4,331,626, which is a division of Ser. No. 832,640, Sep. 12, 1977, Pat. No. 4,217,325, which is a continuation-in-part of Ser. No. 789,410, Apr. 21, 1977, abandoned. This application May 15, 1981, Ser. No. 264,014
Int. Cl.³ B29C 5/04, 1/00, 5/12
U.S. Cl. 425—144 2 Claims

1. An assembly for molding an article of heat-fusing material comprising; a mold presenting a mold surface, a first group of liquid passages disposed adjacent the mold surface over a first area thereof for controlling the temperature over said first area of the mold surface, a second group of liquid passages disposed adjacent the mold surface over a second area thereof for controlling the temperature over said second area of the mold surface, and control means for sequentially supplying liquid to said first and second groups of passages, a mold support means supporting said mold, first manifold means supported by said mold support means for distributing liquid to and collecting liquid from said first group of passages, and second manifold means supported by said mold support means for distributing liquid to and collecting liquid from said second group of pas-

sages, pedestal means for rotatably supporting said mold support means for rotation about an axis for emptying said mold of liquid heat-fusing material, a first supply line in communication with said first manifold means and a second supply line in communication with said second manifold means, a first swivel means disposed on said axis for allowing said first supply line to rotate with said mold support means and second swivel means disposed on said axis in axially spaced relationship to said first swivel means for allowing said second supply line to rotate with said support means, a heat-fusing material supply and retrieval module for supplying liquid heat-fusing material to said mold surface and for retrieving liquid heat-fusing material emptied from said mold, said module including conveyance means for facilitating movement thereof away from said pedestal means and said mold support means, said module including a dump tank for positioning below said mold support means for



receiving and retrieving liquid heat-fusing material emptied from said mold, said module including a frame structure supporting a heat-fusing material storage tank, a heat-fusing material heat exchanger for heating the heat-fusing material, supply conduit means for supplying heat-fusing material to said mold, return conduit means for returning heat-fusing material from said dump tank to said storage tank, pump means for circulating the heat-fusing material, and valve means for controlling the circulation of heat-fusing material through said storage tank, said heat exchanger and said conduit means, said control means including a hot liquid circuit having control valves, a pump and first heat exchange means for sequentially supplying liquid to said first and second supply lines and a cold liquid circuit having control valves, a pump and second heat exchange means for sequentially supplying liquid to said first and second supply lines.

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**4,389,178**

## RAM-TYPE FEEDER FOR BRIQUETTING PRESS

**Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.**

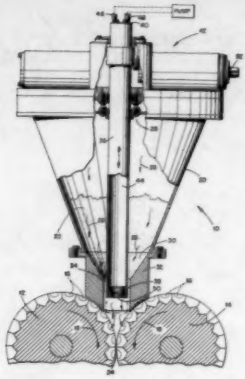
**Filed Jul. 31, 1981, Ser. No. 288,799**
**Int. Cl.³ B29C** *3/02, 3/04*
**U.S. Cl. 425—237** **8 Claims**

1. A feeder for a briquetting press in which particulate material is compressed in complementary cavities spaced about the peripheries of a pair of cooperating, rotating rolls, said feeder comprising:

a. a funnel for directing said particulate material toward the nip of said rolls;

b. elongated ram means coaxially disposed in said funnel for compressing said particulate material into the nip of said rolls;

c. drive means for reciprocating said ram means in an axial stroke, the rate of reciprocation and the length of stroke being selectively adjustable; and



d. means interconnecting said ram means and said drive means for adjustably controlling the pressure exerted by said ram means on said particulate material.

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**4,389,179**

## APPARATUS FOR FORMING PLASTIC SHEET

**Robert F. Westcott, Norwalk, and John R. Delamater, Berlin Heights, both of Ohio, assignors to American Hoechst Corporation, Somerville, N.J.**

**Division of Ser. No. 135,848, Mar. 31, 1980, Pat. No. 4,329,307.**
**This application Nov. 30, 1981, Ser. No. 325,956**
**Int. Cl.³ B29C** *7/14*
**U.S. Cl. 425—302.1** **4 Claims**

1. An apparatus for continuously forming plastic sheet to a desired cross-section comprising: means for continuously feeding a sheet of plastic to a machine table; means for advancing said sheet along said machine table; a first heating means positioned relative to said machine table and adapted to heat a predetermined first edge portion of said sheet to its softening point; a first forming means having a first transition guide; said first forming means being positioned generally in line with said first heating means; said first transition guide positioned relative to said machine table so as to slidably engage said first heated edge portion and to cause said first heated edge portion to rotate through a plane transverse to said machine table; a first cooling means positioned relative to said machine table so as to reduce the temperature of said heated first edge portion below its softening point; a second heating means positioned relative to said table for heating a predetermined second edge portion of said sheet to its softening point; said second heating means being positioned on the opposite side of said machine table relative to said first heating means; a second forming means having a second transition guide positioned generally in

line with said second heating means; said second transition guide being positioned relative to said machine table so as to engage said heated second edge portion as it advances along said machine table and adapted to cause said second edge portion to rotate through a plane transverse to the surface of said machine table; a second cooling means positioned relative to said second forming means whereby said advancing second edge portion engages said second cooling means to reduce said heated second edge portion to a temperature below its softening point and cutting means positioned relative to said machine table and adapted to cut said sheet to a desired length.

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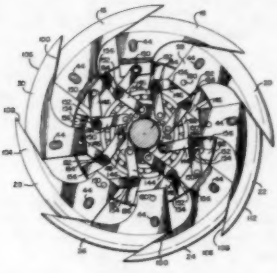
**4,389,180**

## MANDREL WITH IDENTICAL EXPANDING SEGMENTS

**John H. Gordon, 855 Brandywine Rd., Downingtown, Pa. 19335**

**Filed Jun. 25, 1981, Ser. No. 277,279**
**Int. Cl.³ B29C *17/00*; B29D *23/00***
**U.S. Cl. 425—403** **5 Claims**



1. A machine for providing a bell with an annular groove in an end of a plastic pipe comprising

nose means and body means shaped to form the configuration of the bell,

said nose means and said body means being non-rotative,

said nose means and said body means defining an operating opening therebetween;

a plurality of identical segment means circularly arranged in the said opening to impress an annular groove in the bell,

said segment means each being equally radially reciprocal between respective retracted positions and respective expanded positions;

an axially aligned shaft through the nose means the body means and the circle defined by the segment means, the shaft being adapted for rotative reciprocation relative to the nose means and the body means;

link means pivotally connected to at least some of said segment means to reciprocate the segment means radially outward of the shaft,

the link means comprising pairs of interconnected inner links and outer links, each outer link being pivotally connected to one of the segment means,

the pairs of links being interconnected by actuating pivot pins, the said pins extending both forwardly and rearwardly of the interconnected links to provide forward and rearward pin extensions, and

followers secured to the actuating pivot pins at the said forward and rearward pin extensions; and

actuating plate means rotatively reciprocated by the shaft, said activating plate means being adapted to pivot the link means radially to reciprocate simultaneously the segment means upon rotative reciprocation of the shaft,

the activating plate means comprising forward and rearward shaped slots, the said followers being positioned within the slots to pivotally move the pairs of links upon circular reciprocation of the actuating plate means.

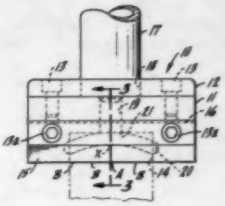


**4,389,181**

## WIDE BAND EXTRUDER NOZZLE

**Richard H. Frick, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Sep. 24, 1981, Ser. No. 305,046**
**Int. Cl.³ B29F *3/04***
**U.S. Cl. 425—461** **4 Claims**



1. An extruder nozzle for producing a relatively wide flat ribbon of extruded fluid comprising in combination, a fluid supply inlet, a main body portion forming a first side boundary of an elongated channel of constant and generally rectangular cross-section terminating in an orifice, said main body portion having a groove therein, the mean cross sectional area of the groove being substantially greater than the cross-sectional area of the supply line, said groove communicating with said inlet and being substantially arcuate in shape and positioned in said main body portion so that the ends of said groove are closer to the orifice than is the center of said groove, said groove being dimensioned so as to cause a fluid to flow generally uniformly through the entire length of the orifice so as to cause the orifice to fill essentially completely with fluid, a front cover plate for providing a second side boundary of the channel opposite the first side channel boundary formed by said main body portion, and a shim means positioned between said main body portion and said front cover plate to establish the cross sectional area of the channel from which the fluid is extruded, said shim means forming two opposed end boundaries of said channel and dimensioned so that said arcuate groove in said main body portion is terminated at both its ends by said shim means thereby establishing a reservoir of fluid at each end of said arcuate groove to facilitate extruding a ribbon of relatively even thickness from said nozzle.

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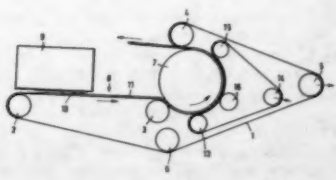
**4,389,182**

## CONTINUOUSLY OPERABLE CHIPBOARD PRESS

**Rolf Gersbeck, Ronnenberg, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany**

**Filed Jan. 27, 1982, Ser. No. 343,307**
**Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103050**
**Int. Cl.³ B28B *21/00***
**U.S. Cl. 425—505** **4 Claims**



1. A continuously operable chipboard press comprising:

(a) a heated press drum, and means for heating the same;

(b) a first endless steel belt adapted to be pressed on one face

thereof against the inner surface of said drum in a pressing section around said drum;

(c) a plurality of direction-changing rolls around which said first belt passes, and means for tensioning said first belt around said drum in said pressing section, certain of said rolls being arranged substantially horizontal so as to permit said first belt to receive, in advance of said drum, a chip cake of wood chips and adhesive to be formed into such chipboard;

(d) at least one of said direction-changing rolls bearing against the opposite face of said first belt and serving as a pressure roll;

(e) a second endless steel pressing belt overlying said first belt in the pressing section, and

(f) an additional set of direction-changing rolls around which said second belt passes and is tensioned, at least certain of said additional rolls pressing said second belt against the opposite face of said first belt over the entire or part of said pressing section, whereby the high pressure in said pressing section results in a cured and hardened wood chip mixture.

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**4,389,183**

## EXTERNAL FRAME INJECTION MOLDING APPARATUS

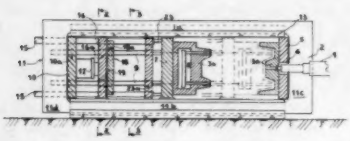
**Jean Laurent, Oyonnax; Bernard Monnet, Billignat, and Philippe Pertuis, Oyonnax, all of France, assignors to Pont-A-Mousson S.A., Nancy, France**

**Filed Oct. 3, 1980, Ser. No. 193,692**

**Claims priority, application France, Oct. 9, 1979, 79 25523**

**Int. Cl.³ B29C *1/16*; B29F *1/00***

**U.S. Cl. 425—589** **9 Claims**



1. A device for the injection molding of plastic articles or the like, said device having a generally horizontal axis and comprising a fixed first plate and a movable second plate respectively bearing the two halves of a mold, a fixed third plate or bed, and means for moving the movable second plate and for urging the two halves of the mold together, characterized by: the fixed first plate (5) and the bed (10) being mounted within at least two hollow rectangular frames (11) disposed parallel to each other, said frames being independently suspendedly supported by the fixed plate (5) and the bed (10) with no rigid connections between ones of said frames.

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**4,389,184**

## COMBUSTION CONTROL APPARATUS

**Toshio Tanaka, Toride; Sumio Nakagawa, Matudo, and Kenzi Toudo, Yanai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**PCT No. PCT/JP80/00008, § 371 Date Sep. 23, 1980, § 102(e) Date Sep. 23, 1980, PCT Pub. No. WO80/01604, PCT Pub. Date Aug. 7, 1980**

**PCT Filed Jan. 24, 1980, Ser. No. 224,289**

**Claims priority, application Japan, Jan. 24, 1979, 54/6158**

**Int. Cl.³ F23N *5/24***

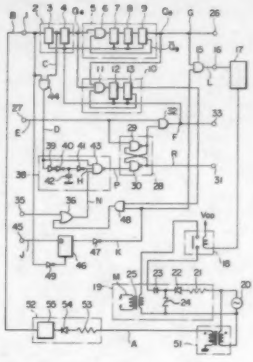
**U.S. Cl. 431—15** **14 Claims**

1. A combustion control apparatus comprising:

timer means including a reference clock pulse generator and a counter for producing first and second timing signals upon counting predetermined first and second numbers of reference clock pulses, respectively, said second number being larger than said first number;

means including an OR gate for producing an output signal in response to either one of a first malfunction signal which is produced when a flame signal indicative of ignition of fuel is not produced before generation of said second timing signal and a second malfunction signal indicative of an abnormality of one or more external devices associated with the apparatus;

means including an R-S flip-flop for producing, when it is rendered operative, a set signal in response to said output signal of said OR gate;



detection means for producing a detecting signal in response to a second clock pulse produced at the timing corresponding to a selected one of the leading and trailing edges of the reference clock pulse;

means for rendering said R-S flip-flop operative under the AND condition of said detecting signal and said output signal of said OR gate; and

control means for producing output signals for controlling operation of the external devices, said output signals being produced at the timing corresponding to the other of the leading and trailing edges of the reference clock pulse.

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**4,389,185**

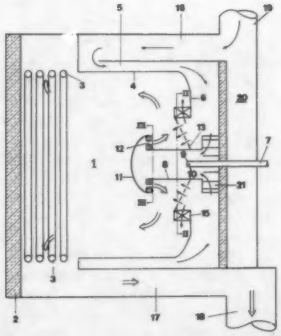
## COMBUSTOR FOR BURNING A VOLATILE FUEL WITH AIR

**Jan A. Alpkvist, Spindelgatan 2, SE-582 58 Linköping, Sweden**

**Filed Oct. 31, 1980, Ser. No. 202,473**

**Int. Cl.³ F23D *11/44***

**U.S. Cl. 431—164** **3 Claims**



1. An improved combustor for burning a volatile fuel with preheated air and of the type comprising a generally cylindrical vaporizer extending into a combustion cham directly heated by the combustion gases, a fuel s

extending coaxially into said vaporizer and terminating therein through radially directed fuel exit openings, said vaporizer having a part extending outside said combustion chamber being provided with inlet openings for receiving primary combustion air and for rendering to the primary air a rotary movement coaxially with said vaporizer, the vaporizer terminating within said combustion chamber and the vaporized fuel-air flowing through an outlet directed towards inlet openings for secondary combustion air supplied directly to said combustion chamber, said secondary air inlet openings being positioned adjacent the vaporizer, the improvement comprising duct means for preheating both the primary and secondary air supply, and said vaporizer being a substantially rotationally symmetrical unit including means connected to said duct means, for channeling said preheated primary and secondary air.

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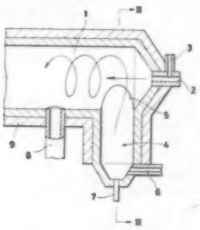
**4,389,186**

## COMBUSTION APPARATUS

**Yoshio Kawamura, Yatabemachi, Japan, assignor to Agency for Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan**

**Filed Mar. 3, 1981, Ser. No. 240,194**
**Int. Cl.³ F23G 5/32**
**U.S. Cl. 431—173** **3 Claims**



1. A combustion apparatus comprising a main combustion chamber, a secondary fuel supply means for supplying into the main combustion chamber 10 to 40% of all the fuel to be supplied, an auxiliary combustion chamber disposed in the lateral wall of the main combustion chamber to permit combustion gas to flow to the position at which the fuel for the main combustion chamber is supplied, a first fuel supply means for supplying 60 to 90% of all the fuel to be supplied into the auxiliary combustion chamber, a first air supply means for supplying air in an amount equal to the amount theoretically required for combustion of the fuel supplied into the auxiliary combustion chamber, and a second air supply means disposed on the lateral wall of the main combustion chamber at a position downstream of the position at which the combustion gas from the auxiliary combustion chamber is supplied.

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**4,389,187**

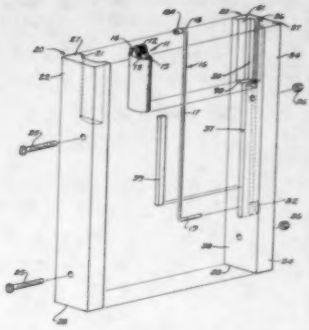
## EXTENDED HOLDER FOR A LIGHTER

**Michael H. Sims, 4102 Aquaverde, Austin, Tex. 78746**

**Filed Mar. 16, 1981, Ser. No. 244,216**
**Int. Cl.³ F23Q 1/02**
**U.S. Cl. 431—277** **16 Claims**

1. A holder for a conventional lighter having a flint and a striking wheel which ignites the lighter fuel upon rotation, the holder comprising:

(a) an elongated frame having an open receptacle at a first end, the receptacle configured to securely retain such a lighter during use; and



(b) an elongated striker means movably secured to the frame for frictionally engaging and rotating the striking wheel of such a lighter when driven longitudinally during use.

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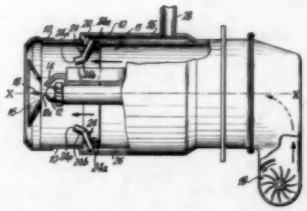
**4,389,188**

## GAS BURNER INJECTOR HEAD

**Bola R. Kamath, Ridge, N.Y., assignor to ABC Sunray Corporation, Commack, N.Y.**

**Filed Nov. 12, 1980, Ser. No. 205,906**
**Int. Cl.³ F23Q 9/00**
**U.S. Cl. 431—284** **9 Claims**



1. A gas burner injector head comprising:

a housing having an annular chamber positioned around a tubular chamber,

said annular chamber having a back end adapted to communicate with a source of gas, said annular chamber having a front end with a plurality of openings therethrough,

said tubular chamber having a back end adapted to communicate with a source of air,

a set of nozzles, one each extending from respective ones of said openings of said annular chamber, each of said nozzles having a forward port, the forward port of each of said nozzles being positioned within whatever stream is caused to flow along said tubular chamber,

a first subset of said nozzle ports being deployed approximately equal distance from one another around a substantially circular locus, and

a second subset of said nozzle ports deployed along an arc of said locus that constitutes a relatively small fraction of the circumference of said circular locus.

**4,389,189**

## REFRACTORY COMPONENTS FOR FURNACES

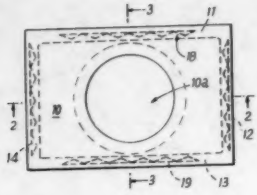
**Barrie J. Harvey, Tyldsley, and Robert C. Willson, Addlestone, both of England, assignors to M. H. Detrick Co., Ltd., London, England**

**Filed Jul. 29, 1981, Ser. No. 288,201**

**Claims priority, application United Kingdom, Jul. 29, 1980, 8024816**

**Int. Cl.³ F27D *1/00*; F04B *5/04***

**U.S. Cl. 432—247** **13 Claims**



1. A refractory component vacuum formed from ceramic fiber to be mounted on an exterior structure which defines the general outline of a furnace chamber, said component forming part of a refractory wall of the furnace chamber and having embedded therein during the vacuum forming process one or more reinforcing members of stiff open-mesh form disposed in that region of the component which will eventually be placed nearest to said structure and from which region the component is to be anchored to the structure, the reinforcing member being made of heat resisting metal alloy, refractory clay or re-crystallized alumina and at least part of said open mesh being arranged to extend generally parallel to the local portion of the wall of the chamber.

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**4,389,190**

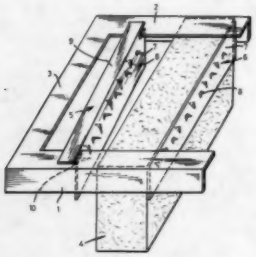
## SUPPORT OF SUSPENSION OF INSULATING MATERIAL

**Theodor J. Sevink, Schaepmanstraat 54, 3762 SV Soest, Netherlands**

**Filed Aug. 18, 1981, Ser. No. 293,792**

**Int. Cl.³ F27D *1/00***

**U.S. Cl. 432—247** **5 Claims**



1. An arrangement for mounting insulatory lining blanket strips within a high temperature furnace, comprising:

(a) a strip of insulatory furnace lining blanket formed of a refractory synthetic material such as felt, said strip having a generally solid rectangular shape,

(b) a support frame including a pair of elongated stainless steel angle irons fixedly disposed parallel to each other and spaced apart a distance approximately equal to the length of said strip,

(c) an elongated stainless steel anchor plate having projections thereon extending into said lining blanket strip across the length thereof and along an edge intended to face outwardly from the interior of the furnace, and

(d) means defining slidable slot and rail connections between opposite ends of said anchor plate and said respective angle irons, whereby a plurality of lining blanket strips may be slidably mounted on said angle irons in stacked abutment to define an overall furnace lining.

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**4,389,191**

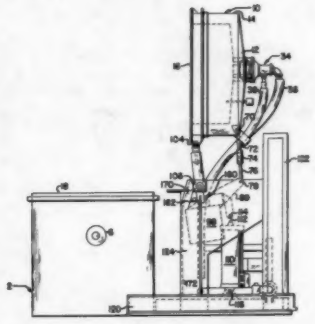
## APPARATUS FOR MOVING A VESSEL HEATER COVER

**Richard L. Lowe, 1906 Shaler Dr., Glenshaw, Pa. 15116**

**Filed Sep. 1, 1981, Ser. No. 298,502**

**Int. Cl.³ F27D *1/18*; F27B *14/00***

**U.S. Cl. 432—250** **24 Claims**



1. Apparatus for moving a vessel heater cover comprising a vessel heater cover,

generally horizontally oriented upper linkage means secured to said cover, at a first elevation,

generally horizontally oriented lower linkage means secured to said cover, at a second elevation,

said first elevation being higher than said second elevation,

bell crank means pivotally secured to said upper linkage means and said lower linkage means,

said lower linkage means including first pivot means connecting said lower linkage means with said cover and second pivot means connecting said lower linkage means with said bell crank means, and

power means for effecting rotation of said bell crank means about said second pivot means, whereby said cover may be rotated into and out of vessel heating position.

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**4,389,192**

## DENTAL REDUCING TOOL

**Siegmund A. Neuwirth, 30 St. George's Rd., Golders Green, London NW11 OLR, England**

**Continuation-in-part of Ser. No. 67,794, Aug. 20, 1979, Pat. No. 4,264,307. This application Apr. 27, 1981, Ser. No. 257,916**

**Int. Cl.³ A61C *3/02***

**U.S. Cl. 433—166** **5 Claims**

1. A tool for removing tooth structure comprising:

a shaft adaptable to be carried by rotating means at one end thereof, a shank extending axially from the other end of said shaft, the surface of said shank being helically grooved to define a reducing element with the crest thereof lying on a helix centered on the axis of said shank,

and the working surface of said reducing element being coated with a suitable abrasive material, the periphery of

said reducing element tapering outwardly in the direction away from said shaft.

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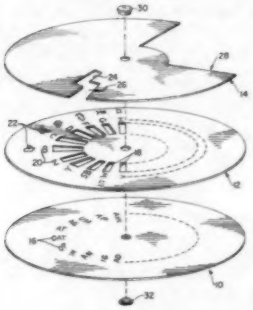
**4,389,193**

## EDUCATIONAL DEVICE

**Morton Phillips, 67-70 Yellowstone Blvd., Forest Hills, N.Y. 11375**

**Filed Dec. 28, 1981, Ser. No. 335,234**
**Int. Cl.³ G09B *1/22***
**U.S. Cl. 434—174** **9 Claims**



1. An educational device, comprising:

a first member having a surface containing a series of word families,

a second member movable with respect to said first member and including a series of word family windows through any of which any of said word families can be viewed, said second member further having an initial sound printed adjacent each of said word family windows, and

a third member movable with respect to said second member and including a word window through which an entire one of said complete words can be viewed and an initial sound window through which one of said initial sounds can be viewed.

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**4,389,194**

## ELECTRONIC APPARATUS FOR TEACHING MATHEMATICS

**Alexander R. Toll, 1348 Penwood Rd., Philadelphia, Pa. 19151, and Roland R. Gibboni, 660 Meadow Brook Ave., Ambler, Pa. 19002**

**Filed Jan. 21, 1982, Ser. No. 341,444**
**Int. Cl.³ G09B *19/02***
**U.S. Cl. 434—201** **10 Claims**

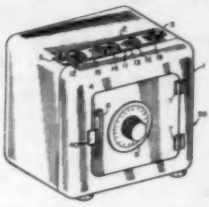
1. An apparatus aid in the teaching of mathematics which comprises:

a case;

access means connected to said case for permitting access to the interior thereof;

latch means operably connected to said case and to said access means, said latch means having a locked mode and an unlocked mode, said latch normally being in the locked mode;

numerical input means arranged in a manner to simulate an algebraic expression; and



operation means for accomplishing mathematical operations, operationally connected to said numerical input means which serves as input therefore, said operation means being adapted to generate an output being operationally connected to said latching means causing it to shift from its locked mode to its unlocked mode thereby permitting the student to have access to the interior of said case when the algebraic equation is mathematically correct.

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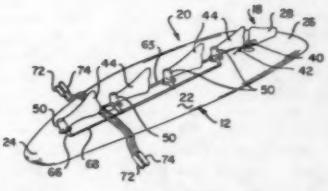
**4,389,195**

## STEERABLE SURFBOARD

**Iraj Sohaei, P.O. Box 1475, El Toro, Calif. 92630**

**Filed Feb. 17, 1981, Ser. No. 234,946**
**Int. Cl.³ B63H *1/36***
**U.S. Cl. 440—15** **1 Claim**



1. A steerable, self-propellable surfboard, comprising, in combination:

(A) a buoyant member forming a means for bearing weight on a liquid, the buoyant member being a substantially planar member configured for riding on a liquid in which the member is disposed, the member having a direction of travel relative to the liquid surface; and

(B) steering means mounted on the buoyant member and actuatable by a rider of the buoyant member for permitting the buoyant member to be maneuvered through a liquid in which the buoyant member is disposed, the steering means including, in combination:

I. rudder means mounted on the buoyant member and actuatable by hands of a rider on the member for causing the buoyant member to change a direction of travel of the member relative to the liquid surface; and

II. fin means mounted on the buoyant member and actuatable by hands of a rider on the member for causing the member to fishtail through a liquid in which the member is disposed for propelling the member through the liquid, the buoyant member having a forward end and a rear end

spaced from one another and defining a normal direction of travel of the member, the rudder means being arranged on the member adjacent the rear end of the member, and the fin means being arranged on the member between the rudder means and the forward end of the member, the rudder means comprising, in combination:

(a) a rudder in the form of a substantially planar piece mounted on the buoyant member for pivoting movement about an axis substantially perpendicular to the plane of the member; and

(b) control means mounted on the member and attached to the rudder for permitting positioning of the rudder from a point spaced from the rear end of the member, the fin means comprising, in combination:

(c) at least one blade mounted on the buoyant member for pivoting movement relative to the member; and

(d) actuating means mounted on the member and attached to the blade for permitting pivoting of the blade from a point on the member spaced from the rear end of the member, the control means including a crank provided on the rudder, a connector element pivotally attached to the crank and arranged for manipulating the rudder, and a lever pivotally mounted on the buoyant member and connected to the connector element for permitting a rider of the member to steer the member by selectively turning the rudder, the actuating means including a further crank provided on the blade at the fin means, a further connector element pivotally attached to the further crank, and a further lever pivotally mounted on the member, the further connector element being pivotally attached to the further lever, the further lever being arranged for manipulating the blade and permitting a rider on the member to propel the member through the liquid in which the member is disposed, there being a plurality of blades forming the fin means, with the rudder and blades having substantially parallel pivot axis which are substantially perpendicular to the plane of the buoyant member, the member having a pair of substantially parallel, planar, oppositely directed faces, one of the faces forming a surface receiving a rider of the member, the other of the faces forming a surface receiving the rudder, blades, and levers, the latter extending longitudinally substantially transverse of a forward to rear end extent of the member and terminating outboard of the member in handles arranged for being gripped by a rider on the member, a bracket extending from a pivot point of the further lever, the lever being pivotally mounted on the bracket extending from a pivot point of the further lever and the connector element being a wire and sleeve arrangement, with the wire being connected to the crank and to the lever and the sleeve being affixed to the member and the further lever.

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**4,389,196**

**WATERCRAFT WITH SWIVEL FIN DRIVE**

**Franz Gander, Feldweg 4, 6370 Stans-Oberdorf, Switzerland**

**Continuation of Ser. No. 53,904, Jul. 2, 1979, Pat. No. 4,304,555. This application Aug. 28, 1981, Ser. No. 297,218**

**Claims priority, application Switzerland, Jul. 5, 1978, 7321/78**

**The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.**

**Int. Cl.³ B63H** *1/36*

**U.S. Cl. 440—15** **15 Claims**

1. A watercraft comprising:

watercraft body means including means for defining a prolongation thereof;

said watercraft body means having a longitudinal direction of extent and a stern;

a propulsion fin provided for said body means;

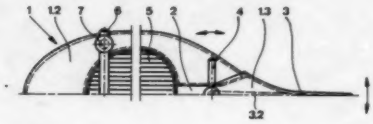
said propulsion fin having an impact surface;

means including a substantially vertical swivel axle for mounting said propulsion fin to be laterally swivellable;

drive means for laterally swivelling said propulsion fin;

said propulsion fin extending from said substantially vertical swivel axle substantially parallel to said longitudinal direction of extent of said watercraft body means and in alignment with said longitudinal direction of extent;

said propulsion fin being arranged at the stern in the prolongation of the watercraft body means;




said watercraft body means defining a pneumatic hose boat having a boat skin which at the stern thereof contains said prolongation which encloses in a watertight fashion the impact surface of said swivellable propulsion fin over its entire height; and said pneumatic hose boat including an inflatable torus having at the stern thereof two spaced ends between which the substantially vertical swivel axle of the propulsion fin is disposed.

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**4,389,197**

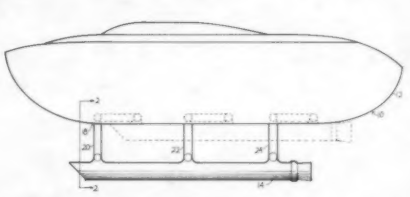
**WATER-GOING VESSEL**

**James S. Ballantine, 121 N. Shore Rd., Absecon, N.J. 08201**

**Filed Sep. 10, 1980, Ser. No. 185,940**

**Int. Cl.³ B63H** *5/12, 11/02*

**U.S. Cl. 440—38** **41 Claims**



1. A water-going vessel having a plurality of water intake turbines each of which is mounted on elevator means extending from the underside of the vessel, with each of said turbines additionally vertically pivotally mounted to said elevator means near the longitudinal midpoint of each turbine and having means for independent pivotal control, and further with the elevator means having failsafe pantographic connection means to each of said turbines for simultaneous extension and retraction of said turbines in unison.

41. An alternating current variable frequency submersible electric motor comprising a stator and a rotor, said rotor having a central collar and having a plurality of blades each attached to the central collar and the rotor, and said stator having disposed therein heat exchange means to cool said stator, and further wherein a flywheel is attached to the rotor and wherein the outer circumference of said flywheel extends beyond the stator, said flywheel having a plurality of blades projecting from its circumferential surface.

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**4,389,198**

**OUTBOARD MOTOR SYSTEM**

**Ronald C. Henderson, Cohasset, Mass., assignor to Harbormaster, Division of Mathewson Corp., Quincy, Mass.**

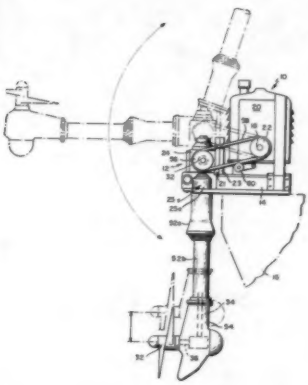
**Filed Sep. 15, 1980, Ser. No. 186,904**

**Int. Cl.³ B63H** *5/12*

**U.S. Cl. 440—60** **4 Claims**

1. An outboard motor assembly comprising a power plant, an outboard propeller assembly including a propeller, a com-

mon support mounted to the stern of the vessel, means stationarily mounting the power plant on the common support with its drive shaft athwartship, a pulley fixed to the drive shaft, a first mounting plate fixed to the common support, a second mounting plate fixed to the propeller assembly, said mounting plates having interengaged tongue and groove means by means of which the propeller assembly can be moved vertically relative to the power plant and which enables dismounting the entire outboard propeller assembly from the vessel, a pair of spaced, parallel bearing blocks mounted to the second mounting plate, a pair of bearing members fixed to the outboard assembly rotatably received and retained in said bearing blocks, supporting the outboard assembly for rotation about a horizontal axis parallel to the axis of the drive shaft, at least one of said bearing blocks containing a bearing opening parallel to the axis of the drive shaft, an input shaft journaled in said bearing opening, a pulley fixed to the said input shaft and a belt entrained about said pulleys, said outboard propeller assembly including a first gear housing, a pair of bevel gears mounted in said gear housing, one of which is fixed to said input shaft for turning about a horizontal axis and the other of which is mounted in the gear housing in mesh with the one gear for rotation about a vertical axis, a transmission shaft journaled in the gear housing with its axis at right angles to the input shaft, said transmission shaft extending through said other gear and



being keyed thereto, a transmission housing mounted to said first gear housing, a second gear housing attached to the lower end of the transmission housing, a propeller shaft journaled in said second gear housing for rotation about a horizontal axis, a pair of meshing gears in said second gear housing, one of which is fixed to the propeller shaft, said transmission shaft extending downwardly through the transmission housing and being keyed to the other of said meshing gears such that rotation of the transmission shaft is transmitted through said second gear housing to the propeller shaft, said transmission housing being rotatably mounted to the first gear housing to enable turning the propeller about the vertical axis of the transmission shaft, a worm wheel fixed to the transmission housing in concentric relation to the transmission shaft, a worm supported in mesh with the worm wheel, a motor connected to the worm shaft to effect rotation of the transmission housing about the axis of the transmission shaft to enable rotating the propeller for steering and pneumatic cylinders mounted on the common support beneath the bearing blocks operable to raise and lower the outboard assembly relative to the common support, said bearing members supporting the outboard assembly for rotation of the propeller assembly from a position in which the transmission shaft extends downwardly from the common support for normal operation through an angle exceeding 180° to a position extending upwardly from the common support and inboard of the axis of rotation of the input shaft to an at rest stable position.

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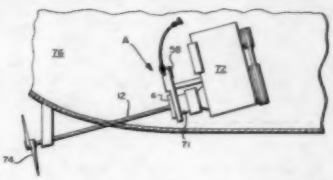
**4,389,199**

## SHAFT LOCK FOR PROPELLERS FOR SAILING BOATS

**Richard D. Badzinski, Oak Creek, and George G. Nigel, St. Francis, both of Wis., assignors to Shaft Lok Inc., New Berlin, Wis.**

**Filed Sep. 4, 1981, Ser. No. 299,397**
**Int. Cl.³ B63H** *5/06*
**U.S. Cl. 440—74** **16 Claims**



1. An auxiliary engine propeller shaft locking device for sailboats and the like comprising:

(a) a base having an upper lock housing and a lower shaft housing

(b) said housings being integral

(c) said shaft housing inclining an aperture therethrough

(d) said housings having front and back surfaces

(e) a shaft disc rotatable on an axis and said disc mounted in said aperture

(f) said lock housing front surface extending beyond said shaft housing front surface

(g) said lock housing surface extending beyond said disc's outer surface and said disc's inner surface being adjacent the plane of said shaft housings front surface to provide rotating clearance for said disc

(h) said shaft disk having a width less than the width of said shaft housing to provide rotating clearance for said disc

(i) said lock housing including a locking pin and a shot pin for said locking pin, said locking pin positioned transverse of said axis

(j) said disc including locking pin engaging means

(k) said locking pin having means for receiving said shot pin including first disc lock position means and said second disc release position means, and

(l) means for moving said locking pin from lock position to said release position and from said release position to said lock position.

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**4,389,200**

## WATER SKI BINDING

**Herbert J. O'Brien, 2832 West Lake Sammamish Northeast, Redmond, Wash. 98052**

**Filed Apr. 3, 1981, Ser. No. 250,602**
**Int. Cl.³ A63C** *5/00*
**U.S. Cl. 441—70** **16 Claims**

1. A water ski binding comprising:

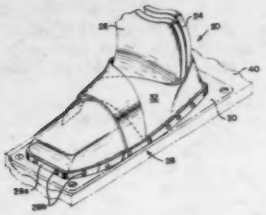
(a) a substantially rigid, unhinged sole plate having top and bottom generally planar surfaces and an edge comprising a surface generally perpendicular to said top and bottom surfaces around a toe, a back, and two sides;

(b) an initially flat elastomeric tongue bent about and attached to the edge of the plate on the toe and two sides;

(c) an initially flat elastomeric heel bent about and attached to the edge of the plate on the back and two sides; and

(d) means for fastening the tongue and heel to the plate so that each projects substantially vertically at the point of contact with the plate, the means for fastening being

adapted to retain the greatest flexibility for the elastomeric material of the tongue and heel and being adapted to allow



substantially unrestricted lateral expansion of the elastomeric tongue and heel around the edges of the plate.

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**4,389,201**

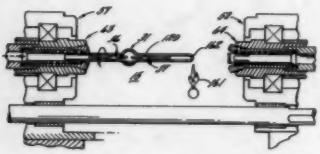
## METHOD OF MANUFACTURING A LAMP

**Richard L. Hansler, Pepper Pike, and Elmer G. Fridrich, Chardon, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.**

**Continuation-in-part of Ser. No. 19,647, Mar. 12, 1979, abandoned. This application Feb. 5, 1981, Ser. No. 231,655**

**Int. Cl.³ H01J** *9/40, 9/46*

**U.S. Cl. 445—26** **16 Claims**



1. A method of manufacturing a lamp, said method comprising the steps of providing a lamp body having a hollow bulbous midportion with tubular neck portions projecting in opposite directions therefrom, inserting a first electrode tip last completely through one and into the other neck portion so that it remains supported solely by said other neck portion, inserting a second electrode tip first into said one neck portion so that it remains supported solely by said one neck portion at a predetermined spacing from the first electrode, and then sealing said electrodes into their respective neck portions.

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**4,389,202**

## SHEARING PIN MOMENT OF ROTATION LIMITING ARRANGEMENT FOR TWO CONSTRUCTIONAL UNITS THAT ARE ROTATABLE RELATIVE TO ONE ANOTHER

**Johann Hochreuter, Brauhausstrasse 6, 8800 Ansbach, Fed. Rep. of Germany**

**Filed May 8, 1981, Ser. No. 261,747**

**Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017722**

**Int. Cl.³ F16D** *3/56, 9/00*

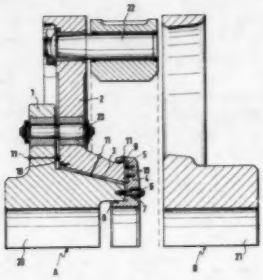
**U.S. Cl. 464—33** **2 Claims**

1. In a torsionally elastic shaft coupling arrangement having a shearing pin moment of rotation limiting arrangement for two constructional units rotatable relative to one another on a common cone bearing surface, over the circumference of which are arranged in spaced apart relationship several mutually engaging shearing pins and which are movable in slight measure axially toward one another as well as being prestressed for a full-surface contacting of the common cone bearing surface and being characterized in that:

(a) said shaft coupling arrangement comprises first and second approximately coaxial coupling halves disposed in stationary arrangement with each being on an associated shaft journal;

(b) the first coupling half being divided into first and second constructional units that are rotatable relative to each other and wherein one is held stationary on the shaft journal associated to said first coupling half and with said second constructional unit being in torsionally elastic engagement with said second coupling half, the arrangement being such that the common cone bearing surface extends taperingly into the intermediate space between said two coupling halves;

(c) said constructional units each having a tapered end with an annular frontal surface being formed on each tapered end, and with said tapered ends being generally oriented along a common axial plane;



(d) an axial locking ring with flanged portions extending therefrom enclosing the annular frontal surfaces of said constructional units, said axial locking ring being secured to said first constructional unit and slightly spaced from both of said annular frontal surfaces to provide a clearance between said ring and said annular frontal surfaces;

(e) an annular running surface being secured to said locking ring and in mating running engagement with the annular frontal surface of said second constructional unit; and

(f) a plurality of resilient attachment elements distributed about the circumference of said first constructional unit and applying an axial biasing force against said ring so as to cause said annular running surface to lie against the annular frontal surface of said second constructional unit.

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**4,389,203**

## OVERLOAD CLUTCH BETWEEN A ROPE DRUM BODY AND A ROPE DRUM SHAFT

**Wilhelm Düntzen, Gladbeck, Fed. Rep. of Germany, assignor to Industrietechnik Kalenborn GmbH, Kalenborn bei Linz/-Rhein, Fed. Rep. of Germany**

**Filed Nov. 3, 1980, Ser. No. 203,416**

**Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947290**

**Int. Cl.³ F16D** *7/02*

**U.S. Cl. 464—34** **7 Claims**

1. An overload clutch for use between a rope drum and a rope drum power axle, comprising:

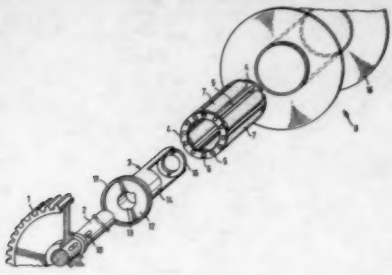
an ancillary compensation member shaped in the form of a drum shaft and mounted on said power axle,

a roller cage provided with a plurality of roller axles and spacer rods and mounted on the ancillary compensation member, and

a plurality of rollers made of an elastic material and mounted on said roller cage, each of the plurality of rollers being fixed to one of said plurality of roller axles, respectively,

said spacer rods spacing and separating the rollers in the cage one from another,

said roller cage including said plurality of rollers being disposed between said rope drum and the ancillary compensation member so as to offer rolling and compression resistance therebetween.



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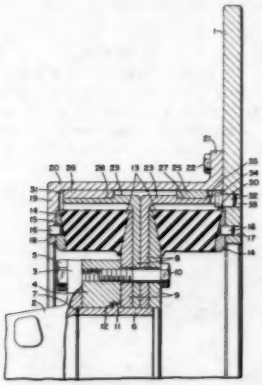
4,389,204

## RESILIENT SHAFT COUPLING, MORE PARTICULARLY AN INTERPOSED CARDAN SHAFT COUPLING

Jürgen Walter, Haltern, Fed. Rep. of Germany, assignor to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 248,029
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012411
Int. Cl.³ F16D 3/78
U.S. Cl. 464—91 4 Claims



1. A resilient rotatable shaft coupling having an axis of rotation for operatively interconnecting two coupling parts including inner and outer coupling parts therewith in such a way that they are radially braced against one another yet have limited freedom of axial movement, said coupling comprising:

an outer flange provided on the outer coupling part;

a cylindrical jacket secured at one end thereof to said outer flange, said jacket having an inner wall and being concentric with the axis of rotation of said coupling, the other end of said jacket being provided with a radially inwardly projecting flange which is perpendicular to said axis of rotation;

a fitting flange provided on the inner coupling part;

bearing rings rigidly secured to said fitting flange and located between said outer flange and inwardly projecting flange of said jacket, said bearing ring being provided with an outwardly directed collar which is coaxial with said axis of rotation and is separated from said inner wall of said jacket by a narrow annular gap;

at least one bearing bushing disposed in said annular gap and resting against said outer collar and said jacket;

two resilient annular members disposed radially inwardly of said collar near the radially inner surface thereof, said resilient annular members comprising an elastomeric material and being provided with axial end faces, rigid securing rings provided on said axial end faces of said annular members including therewith securing rings which face one another and those securing rings located on axially outer end faces of said annular members, said resilient annular members being non-rotatably secured to said securing ring which is secured to said fitting flange and to said outer flange for effecting their interconnection, and two bearing rings, each having a collar and a bearing bushing, said bearing rings and said annular members being disposed back to back on said fitting flange and in mirror image relationship relative to a central plane which is transverse to said axis of rotation, that resilient annular member located remote from said outer flange being non-rotatably secured to said inwardly projecting flange of said jacket, those securing rings located on those axial end faces of said resilient annular members which face one another being located between said annular members and an associated bearing ring, and extending radially inwardly beyond the thickness of said annular member, and bolts for connecting these last mentioned securing rings located on those axial end faces of said resilient annular members which face one another, together with said bearing rings, to said fitting flange.

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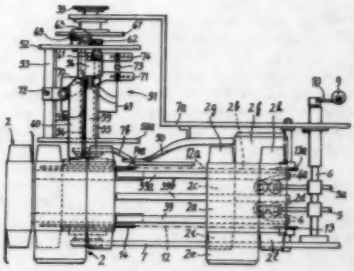
4,389,205

## AUTOMATIC MACHINE FOR FORMING PACKAGING CASES

Bruno Righi, Bologna, Italy, assignor to Centro Automazioni Moderne S.p.A., Rastignano, Italy

Filed Oct. 20, 1980, Ser. No. 198,735
Claims priority, application Italy, Oct. 25, 1979, 3517 A/79
Int. Cl.³ B31B 1/76
U.S. Cl. 493—315 4 Claims



1. An automatic machine for opening packaging cases having an erected parallelepipedal configuration comprising a magazine containing a stack of said cases in a tubular flattened condition, means for picking up individual cases from said stack, a transferring conveyor whereon said picked up cases are deposited and engaged for advance by entraining means arranged on said conveyor, a rotary body provided with at least a peripherical sucker operable to hold a flattened case transferred thereon by said conveyor transversally with respect to the direction of rotation of said body, said machine further comprising a pair of disks interconnected by crossmembers and coaxially connected to said body, guiding rods extending between said disks and parallel to the axis of rotation thereof, a carriage mounted to slide on said rods, a blade ele-

ment pivotally mounted on said carriage for rotation about an axis parallel to said rods and in alignment with said flattened case held on said sucker, means for moving said carriage back and forth along said rods so as to reciprocate said blade between a first position external to said case and a second position in the inside thereof, means being also provided for rotating said blade element within said case thus causing said case to open.

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**4,389,206**

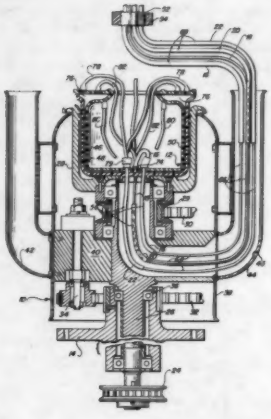
**CENTRIFUGAL PROCESSING APPARATUS AND ROTATABLE PROCESSING BOWL APPARATUS**

**David V. Bacehowski, Wildwood, and Michael J. Brown, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Continuation-in-part of Ser. No. 195,445, Oct. 9, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 243,981**

**Int. Cl.³ B04B** *11/00*

**U.S. Cl. 494—42** **32 Claims**



**23**. An umbilical tubing system adapted to communicate with a rotatable processing bowl of a centrifuge and comprising

oppositely spaced segments, one of which is positioned generally adjacent to the processing bowl and the other of which is positioned generally adjacent the opposite end of said tubing system, said spaced segments being generally resilient to the forces of twisting encountered during centrifugation, and

a middle segment positioned between said spaced segments and having a shear modulus which exceeds the shear modulus of either of said spaced segments for greater stiffness to inhibit tube fatigue and collapse during centrifugation.

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**4,389,207**

**ROTATABLE BOWL ASSEMBLY FOR CENTRIFUGAL PROCESSING APPARATUS HAVING A BONDED AND PREWOUND UMBILICAL SYSTEM**

**David V. Bacehowski, Wildwood, and Ronald Bucheger, Arlington Heights, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Mar. 16, 1981, Ser. No. 244,398**

**Int. Cl.³ B04B** *11/02*

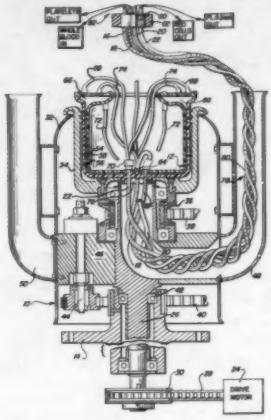
**U.S. Cl. 494—42** **3 Claims**

**1**. A rotatable processing bowl assembly adapted for mounting in a centrifuge and comprising

a rotatable processing bowl, and

an umbilical tubing system including

a plurality of individual flexible tubes each having a maximum outer diameter of approximately 0.25 inches, each of said flexible tubes communicating with said bowl and having an exterior wall and including a first portion extending adjacently from said bowl and a second portion integral with and spaced from said first portion,



said exterior walls of said tubes being bonded together in a helically wound relationship along said respective first portions thereof, said helically wound relationship comprising between approximately two and eight helical loops for each foot of wound length.

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**4,389,208**

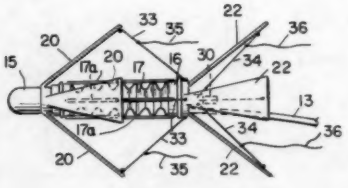
**CATHETER ADVANCER**

**Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. LeVeen, 3-3 Woodlike Rd., Albany, N.Y. 12203**

**Filed Nov. 6, 1980, Ser. No. 204,630**

**Int. Cl.³ A61M** *25/00*

**U.S. Cl. 604—95** **3 Claims**




**1**. A device movable along and within a tubular passageway having a body comprising a head portion, a rear, tail portion and fluid extensible means extensible along a line interconnecting said head portion and said tail portion, said extensible means being connected intermediate said head portion and said tail portion for causing movement of one said portion toward the other said portion in the absence of fluid at a pressure in said means sufficient to extend said means and for causing movement of said one portion away from said other portion when fluid under pressure sufficient to extend said means is supplied thereto, said device further including fluid conduit means extending at least from said tail portion to said extensible means, a plurality of flexible, first legs on said head portion and extending outwardly thereof for engagement with the inner wall of said passageway, said first legs being secured at their head ends to said head portion in circumferentially different positions and having their opposite tail ends disposed rear-

wardly of their head ends, and a plurality of flexible, second legs on said tail portion and extending outwardly thereof for engagement with the inner wall of said passageway, said second legs being secured at their head ends to said tail portion in circumferentially different positions and having their opposite tail ends disposed rearwardly of their head ends, the tail ends of the legs on said head portion being connected to said body adjacent one end of said extensible means by flexible members, second fluid extensible means extensible in the same direction as said first-mentioned extensible means connected intermediate the head ends of said legs and the points of connection of said flexible members with said body, and second fluid conduit means extending from said second extensible means to at least said tail portion whereby the supply of fluid to said second extensible means through said second fluid conduit means causes the tail ends of said legs to move toward said body and the removal of fluid from said second extensible means causes the tail ends of said legs to move away from said body.

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**4,389,209**

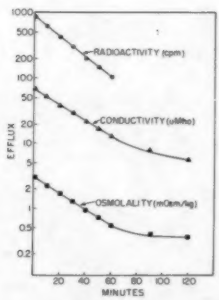
## METHOD OF PROVIDING SYSTEMIC PROTECTION FROM BLOODSUCKING INSECTS AND OTHER PARASITES USING ENCAPSULATED ADDITIVES IN RESEALED ERYTHROCYTES

**John R. DeLoach; Robert L. Harris; Mayery Richard T., all of Bryan, and Garret M. Ihler, College Station, all of Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Division of Ser. No. 160,753, Jun. 18, 1980, Pat. No. 4,327,710. This application Dec. 21, 1981, Ser. No. 332,905**

**Int. Cl.³ A61M *5/00***

**U.S. Cl. 604—53** **1 Claim**




1. A method of treating animals to provide systemic protection against blood sucking parasites comprising:

(a) withdrawing whole blood from a live animal;

(b) preparing washed packed erythrocytes from said whole blood;

(c) encapsulating within said erythrocytes an effective amount of a blood sucking parasite controlling material;

(d) recovering the erythrocytes containing said material;

(e) injecting said live animals with the recovered erythrocytes.

**4,389,210**

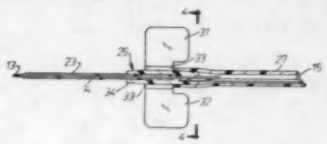
## CATHETER PLACEMENT ASSEMBLY HAVING AXIAL AND ROTATIONAL ALIGNMENT MEANS

**Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Continuation of Ser. No. 93,093, Nov. 9, 1979, abandoned, which is a continuation of Ser. No. 935,442, Aug. 21, 1978, Pat. No. 4,192,306. This application Oct. 2, 1981, Ser. No. 307,978**

**Int. Cl.³ A61M *5/00***

**U.S. Cl. 604—177** **1 Claim**




1. An intravenous catheter assembly comprising:

(a) a flexible plastic catheter having a distally tapered distal end;

(b) a winged catheter insertion means having a tubular portion centrally disposed therethrough, the proximal end of said catheter being fixedly attached to, extending from and in fluid communication with said tubular portion of said catheter insertion means via its distal end;

(c) a pair of flexible wing members extending from said winged catheter insertion means, said flexible wing members each having a weakened portion adjacent said tubular portion of said winged catheter insertion means effective to facilitate the folding upward and pinching together of said flexible wing members and, thereby, the performance of venipuncture upon the patient;

(d) each of said flexible wing members also having a reduced width portion proximate the connection between said flexible wing members and said tubular portion, constructed and arranged to facilitate said folding upward of said wing members,

(e) each of said flexible wing members further having, in conjunction with said reduced width portion, a cut out portion proximate the proximal end of said catheter hub, constructed and arranged to provide an open area adjacent to said proximal end of said catheter hub, so as to facilitate connection of said catheter hub to flexible tubing extending from said catheter assembly; and

(f) a needle slidably disposed in and inserted through said catheter and said tubular portion of said winged catheter insertion means, said needle having a sharpened distal end extending beyond said distal end of said catheter and a proximal end attached to a needle hub.

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**4,389,211**

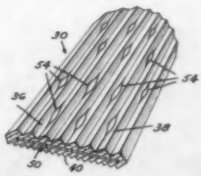
## CATAMENIAL BANDAGE

**Arlene R. Lenaghan, 674 Rudgate, Bloomfield Hills, Mich. 48013**

**Filed Jun. 1, 1981, Ser. No. 269,361**

**Int. Cl.³ A61F *13/16***

**U.S. Cl. 604—383** **4 Claims**




1. A catamenial bandage pad comprising:

(a) an elongate, relatively flat shell of resilient, form retaining material having a top and bottom surface corrugated in a longitudinal direction, the top surface having spaced openings in the valleys of the corrugations, and

(b) an elongate, relatively thin, compressed sheet of hydrophillic material encapsulated in a filler gauze and relatively coextensive with and encased in said shell, said hydrophillic material being expansible in the presence of fluid to have a sponge-like attraction for fluid entering the shell.

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**4,389,212**

## DIAPER WITH POTENTIALLY ELASTIC TAPE FASTENER

**Ludwig Tritsch, Wilmette, Ill., assignor to Personal Products Company, Milltown, N.J.**

**Filed Dec. 2, 1981, Ser. No. 326,726**

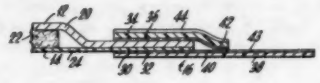
**Int. Cl.**[3] **A41B** *13/02*

**U.S. Cl. 604—389** **6 Claims**

1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward the wearer, a moisture-impervious backing sheet substantially co-extensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and adhesive tape tab fastening means which comprises:

(a) a first anchoring portion secured to the diaper outside surface at a marginal portion thereof;

(b) a second anchoring portion secured to the diaper inside surface at a marginal portion thereof, said second anchoring portion being made from elastic web material;



(c) an attachment portion temporarily attached to the first anchoring portion and adhesively secured to said second anchoring portion, said temporary attachment being such that it is broken before the attachment portion can be detached from said second anchoring portion; and

(d) said attachment portion having a free working end provided with a layer of pressure-sensitive adhesive on one face thereof.

4,389,213

## USE OF ESTERIFIED OXALKYLATES AS FORMULATION AGENTS FOR DYESTUFFS AND CORRESPONDING DYESTUFF PREPARATIONS

Manfred Schneider, Eppstein; Hubert Kruse, Kelkheim, and Konrad Opitz, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

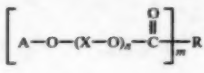
Filed Apr. 23, 1982, Ser. No. 371,231

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116581

Int. Cl.³ C09B 67/46; D06P 67/02

U.S. Cl. 8—524 10 Claims

1. A method of using a water-soluble compound of the formula I



(I)

in which A represents an aliphatic radical having 10 to 24 C atoms, X represents identical or different groups of the formula

$$—CH_2—CH_2— \text{ and } —CH_2—CH(CH_3)—,$$

R represents radicals of a carboxylic acid $R(COOH)_m$ having up to 22 C atoms, m is 1 or 2 and n denotes identical or different numbers from 8 to 100, as a preparation agent for dyestuffs.

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4,389,214

## PROPYLENE OXIDE REACTION PRODUCTS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Paul Schäfer, Riehen; Heinz Abel, Reinach, both of Switzerland, and Fritz Mayer, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 52,363, Jun. 27, 1979, abandoned, which is a division of Ser. No. 814,376, Jul. 8, 1977, abandoned, which is a division of Ser. No. 671,874, Mar. 29, 1976, Pat. No. 4,055,393.

This application Dec. 22, 1980, Ser. No. 219,164

Claims priority, application Switzerland, Apr. 4, 1975, 4293/75

Int. Cl.³ D06P 67/00; C09B 67/00

U.S. Cl. 8—527 5 Claims

1. A process for dyeing or printing a synthetic fibrous material or mixture thereof with a natural fibrous material comprising the step of dyeing or printing in the presence of at least one propylene oxide reaction product or a salt thereof obtained by reacting an adduct of

(a) an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms, and

(b) 1,2-propylene oxide, with

(c) an aliphatic dicarboxylic acid containing 2 to 10 carbon atoms, an aromatic dicarboxylic acid containing 8 to 12 carbon atoms, or an anhydride thereof,

and at least one of the following components:

(d) an aliphatic diol with a molecular weight of at most 2000,

(e) a fatty alcohol containing 12 to 22 carbon atoms,

(f) a fatty acid containing 12 to 22 carbon atoms,

(g) an aliphatic monoamine or diamine containing 2 to 12 carbon atoms,

of which component (g) is used only at the conclusion and only if component (c) is ethylenically unsaturated and of which component (f) is used only when at least one of components (d), (e) or (g) is used.

4,389,215

## ANTHRAQUINONE-AZOMETHINE COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND PROCESSES FOR DYEING SYNTHETIC FIBRE MATERIALS AND FOR PIGMENTING ORGANIC MACROMOLECULAR SUBSTANCES

Rütger Neeff; Meinhard Rolf, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 170,449, Jul. 21, 1980, Pat. No. 4,319,025.

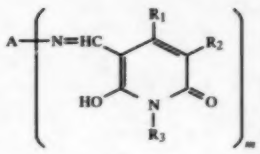
This application Sep. 24, 1981, Ser. No. 305,568

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931710

Int. Cl.³ C09B 55/00, 1/20

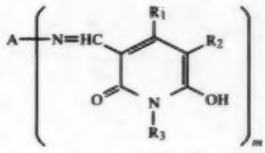
U.S. Cl. 8—637 6 Claims

1. A process for pigmenting an organic macromolecular substance which comprises adding thereto an anthraquinone-azomethine compound of the formula



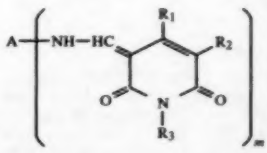
(I)

or of the tautomeric formula



(Ia)

or of the tautomeric formula



(Ib)

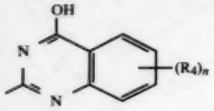
in which

A denotes an anthraquinone radical which is free from sulphonic acid groups and optionally further substituted,

$R_1$ denotes hydrogen, $C_1$–$C_4$-alkyl, hydroxy-$C_1$–$C_4$-alkyl, phenyl, phenyl substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carbamoyl, carbamoyl substituted by $C_1$–$C_4$ alkyl, phenyl, substituted phenyl with a substituent of $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluorine, chlorine, bromine or nitro or benzyl, sulfamoyl, sulfamoyl substituted by $C_1$–$C_4$ alkyl, phenyl which in turn is optionally further substituted by $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluorine, chlorine, bromine or nitro or benzyl, acylamino, or arylamino, carboxyl, carboxylic acid, $C_1$–$C_4$ alkyl ester or hydroxyl,

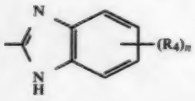
$R_2$ denotes hydrogen, halogen, nitro, cyano, carbamoyl, or sulfamoyl, substituted carbamoyl or substituted sulfamoyl where the substituent is $C_1$ to $C_4$ alkyl, phenyl which in turn can be itself substituted by $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy, fluorine, chlorine, bromine or nitro or benzyl, sulfonic acid $C_1$–$C_4$ alkyl ester, sulphonic acid aryl ester, $C_1$–$C_4$ alkylcarbonyl, $C_1$–$C_4$-alkoxycarbonyl, benzoyl,

benzoyl substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carbamoyl, sulfamoyl carbamoyl or sulfamoyl substituted by $C_1$–$C_4$ alkyl, phenyl which in turn can be substituted by $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluorine, chlorine, or bromine or nitro, or benzyl, acylamino or arylamino, alkyl or phenyl sulphone, or phenyl sulphone substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carbamoyl, sulfamoyl, acylamino, arylamino, substituted carbamoyl or substituted sulfamoyl where the substituent is $C_1$–$C_4$ alkyl, alkyl which in turn can be substituted by $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluorine, chlorine, bromine or nitro or benzyl, or a hetero-aromatic radical of the formula



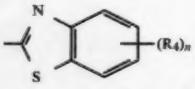
(II)

or of the formula



(III)

or of the formula



(IV)

$R_3$ denotes aryl, aryl substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carbamoyl, sulfamoyl, acylamino, arylamino, substituted carbamoyl or substituted sulfamoyl where the substituent is $C_1$ to $C_4$ alkyl, phenyl which in turn can be substituted by $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy, fluorine, chlorine, bromine or nitro or benzyl or heteroaryl where the aryl radical of the heteroaryl moiety can be substituted in the same manner as said substituted aryl, cycloalkyl or $C_1$–$C_{12}$ alkyl, it being possible for the alkyl chain to be interrupted by oxygen or sulfur and/or substituted by hydroxyl, $N(R_5)_2$— or —$N(R_5)_3{}^{\oplus}X^{\ominus}$ groups,

$R_4$ denotes halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carboxamide, sulphonamide, acylamino, or arylamino,

$R_5$ denotes hydrogen, $C_1$–$C_4$ alkyl, cycloalkyl, aryl or substituted aryl substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, nitro, trifluoromethyl, cyano, carbamoyl, sulfamoyl, acylamino, arylamino, substituted carbamoyl or substituted sulfamoyl where the substituent is $C_1$–$C_4$ alkyl, phenyl which in turn can be substituted by $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluorine, chlorine, bromine, or nitro, or benzyl,

X denotes an anion,

m denotes 1, 2, 3, or 4 and

n denotes 0, 1, 2, 3, or 4.

## 4,389,216

## NAVY DYE MIXTURES

**Udo Bergmann, Darmstadt; Helmut Degen, Frankenthal; Guenter Hansen, Ludwigshafen; Reinhold Krallmann, Weisenheim, and Wolf-Dieter Kermer, Fussgoenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

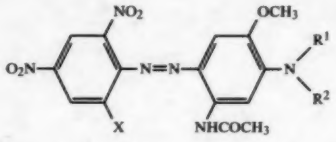
**Filed Mar. 5, 1982, Ser. No. 355,309**

**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112427**

**Int. Cl.**[3] **C09B** *29/08;* **D06P** *3/52*

**U.S. Cl. 8—639** **1 Claim**

1. A dye mixture which contains, as essential components, compounds of the formula I



I

in the following amounts, based on the total weight of the mixture:

| | | | |
|---|---|---|---|
| X = Br | $R^1 = C_2H_4CN$ | $R^2 = CH_2CH{=}CH_2$ | 39–49%, |
| X = Br | $R^1 = C_2H_4CN$ | $R^2 = H$ | 1–10%, |
| X = Br | $R^1 = H$ | $R^2 = CH_2CH{=}CH_2$ | 4–16%, |
| X = Cl | $R^1 = C_2H_4CN$ | $R^2 = H$ | 15–25%, |
| X = Cl | $R^1 = C_2H_4CN$ | $R^2 = CH_2CH{=}CH_2$ | 4–9%, |

and

X = Cl, $R^1 = CH_2{-}CH(OH){-}CH_2{-}O{-}C_4H_{9(n)}$, $R^2 = H$ — 4–10%.

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## 4,389,217

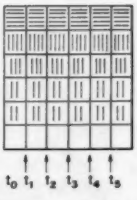
## INTEGRATED TIME-TEMPERATURE OR RADIATION-DOSAGE HISTORY RECORDING DEVICE

**Ray H. Baughman; Gordhanbhai N. Patel, both of Morris Plains, and Granville G. Miller, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Continuation of Ser. No. 38,041, May 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 839,542, Oct. 5, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,931**

**Int. Cl.**[3] **G01K** *11/12;* **G01N** *31/00;* **G01T** *1/02, 1/08*

**U.S. Cl. 436—2** **15 Claims**




1. A device comprising a substrate having deposited thereon at least two indicating units, each unit comprised of an acetylenic compound, or simple mixture thereof, each acetylenic compound containing at least one —C≡C—C≡C group, capable of reacting by 1,4-addition polymerization, thereby forming an end-point color after an irreversible, progressive color change upon thermal annealing or exposure to radiation selected from visible, ultraviolet, gamma ray, x-ray, alpha ray, beta ray, electron beam and laser beam radiation, said end-

point color representing an integrated time-temperature history of thermal annealing or radiation-dosage history of exposure to said radiation, wherein one indicating unit is unreacted and representing zero time of exposure and the other said indicating unit being pre-reacted at 20°–300° C. by thermal annealing or exposure to said radiation to known extent and color, whereby the time required by such pre-reacted unit to form the end-point color by thermal annealing at a given temperature or for a known thermal history or exposure to said radiation at a given average radiation dosage rate is pre-determined and known.

15. A process for measuring the integrated time-temperature or radiation-dosage history of an article comprising the steps of (a) applying to an article the device of claim 1 and (b) observing the developing color changes in the device.

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**4,389,218**

## PRODUCTION OF SOLID FUEL SHAPES FROM COAL FINES

**John C. Pike, Federal Way, Wash., assignor to Blackfire Coal Products, Federal Way, Wash.**

**Filed Sep. 16, 1981, Ser. No. 302,827**
**Int. Cl.³ C10L *5/20, 5/32***
**U.S. Cl. 44—6** **11 Claims**

1. A method of manufacturing solid fuel shapes in the nature of a log or brick, from coal particles, comprising:

mixing substantially dry coal particles with ammonium lignium sulphonate, in a quantity and concentration sufficient to produce a mixture in which the ratio of coal particles to lignium solids is between 13:1 and 20:1 by weight;

controlling the moisture in the mixture to an amount sufficient to cause the coal particles to merely be surface wetted;

providing a mold cavity having first and second open ends;

providing a closure over the first open end;

introducing some of said mixture into the second open end;

moving a piston into said second open end to compress the mixture into the shape of the mold cavity;

removing the closure from the first end of the cavity;

moving a piston through the cavity to move the shape outfrom the first end of the cavity;

heating the shape in a kiln to no more than about 200° F. until hardened; and

providing the shape with a protective cover to prevent moisture absorption in the shape.

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**4,389,219**

## STABILIZED COAL-OIL MIXTURE

**Akihiro Naka, Joyo, and Shuichi Honjo, Kyoto, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan**

**Filed Feb. 23, 1982, Ser. No. 351,388**
**Claims priority, application Japan, Apr. 3, 1981, 56-50715**
**Int. Cl.³ C10L *1/18***
**U.S. Cl. 44—51** **17 Claims**

1. A coal-oil mixture composition comprising a fuel oil, 20 to 70% by weight of pulverized coal and an effective amount of, as a stabilizing agent, a polyether-type adduct of a molecular weight from 6,000 to 600,000 of a lower alkylene oxide with a starting compound selected from the group consisting of:

(a) a poly(lower alkyleneimine) having 7 to 200 nitrogen atoms;

(b) an adduct of a lower alkyleneimine having 7 to 200 nitrogen atoms with a compound having at least one active hydrogen atom selected from the group consisting of an alcohol, a phenol, an amine and a carboxylic acid; and

(c) a reaction product of said compound (a) or (b) with a compound selected from the group consisting of an aldehyde, a ketone, an alkyl halide, an isocyanate, a thiocyanate, a compound having active double bond, an epoxy compound, an epihalohydrin, a cyanamide, a guanidine, urea, a carboxylic acid, an acid anhydride, and an acyl halide.

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**4,389,220**

## METHOD OF CONDITIONING DIESEL ENGINES

**John J. Kracklauer, Longmont, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Filed Jun. 4, 1980, Ser. No. 156,301**
**Int. Cl.³ C10L *1/08***
**U.S. Cl. 44—57** **6 Claims**

1. A method of conditioning a diesel engine comprising the steps of:

operating a diesel engine on a diesel fuel containing about 10 to 16 milligram moles, based on the dicyclopentadienyl iron moiety, per 100 kilograms of the diesel fuel, of a diesel fuel soluble organometallo compound selected from the group consisting of dicyclopentadienyl iron; mono- and di-lower alkyl dicyclopentadienyl iron derivatives; mono- and di-lower alkanoyl dicyclopentadienyl iron derivatives; dimer and polymer reaction products of dicyclopentadienyl iron or lower mono- and di-alkyl substituted derivatives thereof; said lower alkyl or lower alkanoyl moieties each having 1 to 8 carbon atoms therein; and mixtures thereof for a period of time sufficient to remove carbon deposits present on the combustion surfaces of the diesel engine and to deposit a layer of catalytically active iron oxide on the combustion surfaces of the diesel engine effective to prevent further formation of carbon deposits, and

thereafter operating the diesel engine for an extended period of time on a diesel fuel containing a reduced amount of a diesel fuel soluble organometallo compound selected from the aforementioned group, said reduced amount of diesel fuel soluble organometallo compound being sufficient to maintain an effective amount of a catalytically active iron oxide layer on the combustion surfaces of the diesel engine to prevent formation of carbon deposits thereon but insufficient to decrease timing delay in the diesel engine.

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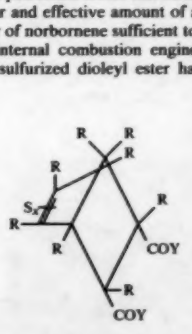
**4,389,221**

## GASOLINE COMPOSITION AND METHOD FOR REDUCING FUEL CONSUMPTION

**Leonard B. Graiff, Houston, Tex.; Rudolf F. Heldeweg, and Corrie M. J. Leenaars, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Jul. 23, 1982, Ser. No. 401,192**
**Int. Cl.³ C10L *1/24***
**U.S. Cl. 44—66** **10 Claims**

1. An improved motor fuel composition comprising a major amount of a liquid petroleum motor fuel boiling in the gasoline range and a minor and effective amount of at least one sulfurized dioleyl ester of norbornene sufficient to reduce fuel consumption of an internal combustion engine employing said motor fuel, said sulfurized dioleyl ester having the general formula:




wherein each R is independently selected from the group consisting of hydrogen and lower alkyl, with the provision that no more than two R's per molecule are lower alkyl, X is an integer from 1 to 8 and each Y contains up to about twenty-

two carbon atoms and is independently selected from the group consisting of hydrocarbon-based oxy radicals and the oxy-residue of a polyhydric alcohol.

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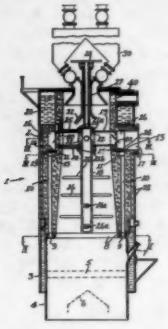
**4,389,222**

## GAS PRODUCERS APPARATUS

**Gerald S. V. Livemore, 121 Holt St., Parkmore, Transvaal, South Africa**

**Filed Jul. 31, 1980, Ser. No. 174,286**
**Int. Cl.³ C10J *3/28***
**U.S. Cl. 48—76** **8 Claims**



**1.** A substantially vertical cylindrical gas producer including a plurality of vertical circumferentially spaced flues in the wall of the producer, each of the said flues being open at its lower end for conveying product gas upwardly; and means for dividing the flues into approximately eight groups and providing each group with a sub-collecting chamber which is further provided with a discharge aperture through which gas may be discharged from the sub-collecting chamber to a common collecting conduit for the groups of flues, the means for dividing, subcollecting chambers, discharge apertures and common collecting conduit being located in the wall of the producer and wherein each sub-collecting chamber is provided with a thermocouple for determining the gas temperature within the associated sub-collecting chamber and wherein the discharge aperture of the sub-collecting chamber is provided with an adjustable damper which is arranged to balance gas flow through the discharge aperture.

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**4,389,223**

## SURFACE CHARACTERISTICS OF BORON RICH CUBIC BORON NITRIDE

**Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio**

**Filed Feb. 9, 1981, Ser. No. 232,597**
**Int. Cl.³ B24D *3/28***
**U.S. Cl. 51—307** **3 Claims**

**1.** An improved boron rich cubic boron nitride having a substantial absence of any surface electrically conducting phase which would interfere with electroplating and which specifically does not interfere with the electroplating of nickel in the manufacture of nickel plated objects containing cubic boron nitride.

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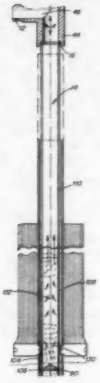
**4,389,224**

## METHOD AND APPARATUS FOR ACCRETING FIBROUS FILTER CARTRIDGES OR OTHER TUBULAR ARTICLES

**Clarence Sicard, 31 Bradford Dr., Cheshire, Conn. 06410**

**Filed Jul. 15, 1981, Ser. No. 283,423**
**Int. Cl.³ B01D *27/02***
**U.S. Cl. 55—55** **26 Claims**



**1.** A method of forming an acreted fibrous batt comprising the steps of passing a porous mandrel in a continual sequence through a unitary tubular housing defining first zone containing a slurry of fibrous material, an intermediate zone and a second zone each free of slurry, applying a vacuum under constant conditions to each of said first and second zones independently of each other to felt said fibers on said mandrel in said first zone and dewater said felted member in said second zone, and regulating the flow of vacuum from said first and second zones into said intermediate zone to separate the water removed from said felted member into its liquid and air phases.

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**4,389,225**

## ELECTROSTATIC PRECIPITATOR HAVING HIGH STRENGTH DISCHARGE ELECTRODE

**Howard P. Willett, Darien, and Even Bakke, Stamford, both of Conn., assignors to Peabody Process Systems, Inc., Stamford, Conn.**

**Continuation-in-part of Ser. No. 85,470, Oct. 11, 1979, abandoned. This application Mar. 26, 1981, Ser. No. 247,797**
**Int. Cl.³ B03C *3/74***
**U.S. Cl. 55—118** **5 Claims**

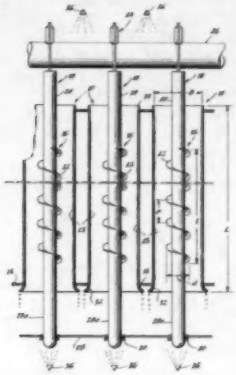
**1.** An electrostatic precipitator for the collection of particulate matter comprising:

A. a plurality of cylindrical collector tubes,
  1. said tubes being substantially circular in cross section and having an inside diameter (D) and a length (L);
  2. said collector tubes being electrically connected to form particle collection electrodes;

B. a plurality of discharge electrodes each comprising
  1. an electrode mast coaxially positioned in each collector tube and having a diameter of from 0.25 to 0.4D, and
  2. a helical discharge electrode in the form of a helical screw flight on each of said electrode masts,
    a. said helical discharge electrodes having a substantially symmetrically curved outer edge,
    b. with the outer diameter (d) of the screw flight and mast being from 0.33 to 0.67 D,

c. a pitch of from D-d/2 to D-d,

d. the overall length (l) of the helical screw flight being from one screw revolution to one-half L, and the helix of the discharge electrode being spaced at a distance greater than D-d/2 from each end of the collector tubes;



whereby a substantially symmetrical, high field strength and current density between the discharge electrode and the collector tube is created when high voltage is applied to said discharge electrode.

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**4,389,226**

## OPEN HEATED BOX TRAYS HAVING FLOW-PROMOTING DEVICES

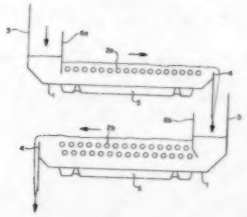
**Eckhard Möller; Horst-Dieter Bures; Karl-Heinz Magosch, all of Marl; Bernt Kesper, Dorsten; Edgar Muschelknautz, and Roland Vogelsgesang, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany**

**Filed Oct. 30, 1981, Ser. No. 316,646**

**Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041632**

**Int. Cl.³ B01D** *19/02;* **B01J** *12/00;* **B01B** *1/02*

**U.S. Cl. 55—208** **3 Claims**



1. An apparatus for heating a viscous or highly viscous liquid the apparatus comprising a heated box tray, inlet means and outlet means in the heated box tray for enabling the liquid to flow therethrough, a heating tube register located in the heated box tray so as to be completely covered by the liquid, and a flow promoting means arranged in the heated box tray for promoting the flow of liquid therethrough, said heated box tray including a bottom plate and being open at a top end thereof, said tube register comprising a plurality of heating tubes spaced from each other and arranged in at least one tube layer, said flow promoting means comprising:

a bottom heating unit arranged below the bottom plate of the box tray, the bottom heating unit being positioned outside and along a bottom surface of said box tray;

a siphon plate mounted on said box tray at the inlet means at a position spaced from a front of the tube register, said siphon plate having a bottom end extending to an underside of the tube register; and

a weir spaced from the tube register and positioned at the outlet means of the box tray, said weir having a top edge extending at least to a top side of the tube register, the spacing between said weir and the tube register being larger than the spacing between the siphon plate at the inlet means and the tube register.

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**4,389,227**

## GAS TURBINE ENGINE AIR INTAKE

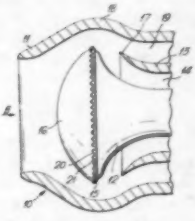
**John R. Hobbs, Amersham, England, assignor to Rolls-Royce Limited, London, England**

**Filed Jan. 14, 1981, Ser. No. 225,109**

**Claims priority, application United Kingdom, Feb. 9, 1980, 8004402**

**Int. Cl.³ B01D** *39/00*

**U.S. Cl. 55—306** **7 Claims**



1. An air intake structure for a gas turbine engine comprising:

a duct having an upstream air inlet for the gas turbine engine, said duct being of circular cross-section;

a center body being circular in cross-section and coaxial with said duct, said center body having a first stem portion extending from within said duct through said air intake and a mushroom-shaped second portion positioned upstream of said air inlet of said duct, said second portion having an upstream facing surface against which liquid impacts and flows across, and said second portion having a maximum diameter greater than a diameter of said air inlet, said maximum diameter of said second portion being spaced upstream from said air inlet;

liquid coalescing means provided on said second portion at said maximum diameter, said liquid coalescing means being arranged to coalesce any liquid impacting and subsequently flowing across said upstream facing surface into large liquid droplets; and

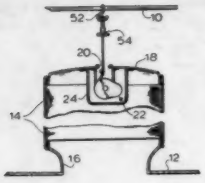
liquid droplet launching means positioned immediately downstream of said liquid coalescing means and upstream of said air inlet means for launching the formed liquid droplets into the air stream passing over said center body, said liquid coalescing means being arranged to form the liquid droplets into a mass, when the same are launched by said liquid droplet launching means, to follow an outward and downstream trajectory sufficient to avoid the air inlet of said duct.

**4,389,228**

## CONSTANT TENSIONING DEVICE

**Carl V. Leunig, Glenmont, N.Y., assignor to Albany International Corp., Menands, N.Y.**

**Filed Aug. 26, 1981, Ser. No. 296,332**
**Int. Cl.³ B01D *46/02***
**U.S. Cl. 55—379** **18 Claims**




1. A filter bag assembly comprising:

a filter bag;

means connected to said filter bag for maintaining it under substantially constant tension, said means including a rotatably mounted cam having an axis of rotation, a cable at least partially trained around a surface of said can, and spring means urging said cam to rotate in a first direction; said spring means exerting a varying spring force dependent upon the rotational position of the cam, said cable arranged with respect to said cam so that when the cam is in a first rotational position where the spring force is relatively high, the cable is tangent to the surface of said cam at a first distance from the axis of rotation of said cam, and when the cam is in a second rotational position where the spring force is relatively low, the cable is tangent to the surface of said cam at a second distance from the axis of rotation of said cam which is smaller than said first distance.

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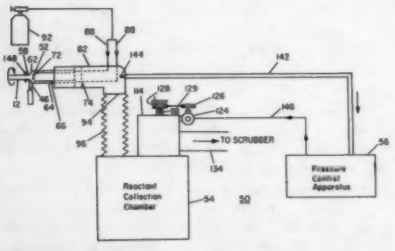
**4,389,229**

## METHODS AND APPARATUS FOR FABRICATING A LIGHTGUIDE PREFORM

**Sei-Joo Jang, Lawrence Township, Mercer County; Knut D. Pohl, Raritan Township, Hunterdon County, and Mansoor A. Saifi, East Windsor Township, Mercer County, all of N.J., assignors to Western Electric Co., Inc., New York, N.Y.**

**Filed Oct. 1, 1981, Ser. No. 307,455**
**Int. Cl.³ C03B *19/00***
**U.S. Cl. 65—3.12** **10 Claims**




1. A method of fabricating a lightguide preform wherein reactants entrained in a carrier gas are directed into the upstream end of a preform tube for chemical reaction to form a glassy soot for deposition therein, a portion of the soot not depositing in said tube and exiting from the downstream end of said tube, the method comprising the steps of:

directing the undeposited soot into a soot exhaust system communicating with the downstream end of said tube, said system having a variable size outlet port;

measuring pressure within the system; and

varying the size of the output port in accordance with the measured pressure to maintain a substantially constant pressure within the soot exhaust system.

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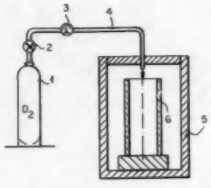
**4,389,230**

## PROCESS FOR IMPROVING THE TRANSMISSION CHARACTERISTICS OF OPTICAL FIBERS DRAWN FROM PREFORMS MADE BY THE MCVD TECHNIQUE

**Eros Modone, Turin, and Giacomo Roba, Cogoleto, both of Italy, assignors to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A., Turin, Italy**

**Filed Jun. 15, 1981, Ser. No. 273,423**
**Claims priority, application Italy, Jun. 16, 1980, 67934 A/80**
**Int. Cl.³ C03B *37/075***
**U.S. Cl. 65—3.12** **5 Claims**




1. A process for improving the transmission characteristics of optical fibers drawn from preforms which are produced by vapor deposition of silica on an inner wall surface of a supporting tube of silica glass,

comprising the step of subjecting at least said inner wall surface of the supporting tube to a pretreatment with deuterium at elevated temperatures and for a period sufficient to isotopically replace a significant number of hydrogen atoms in the tube material close to said inner wall surface with deuterium atoms, said inner wall surface being maintained in contact with gaseous deuterium at a relatively low elevated temperature for inducing deuterium adsorption by the tube wall in a first treatment stage followed by a sharp temperature increase in a second treatment stage for promoting the substitution of hydrogen by deuterium in the tube material.

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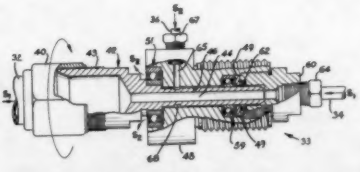
**4,389,231**

## METHOD FOR SUPPLYING FLUID TO A ROTATING TUBE

**Fred P. Partus, Marietta, Ga., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Jun. 1, 1981, Ser. No. 268,611**
**Int. Cl.³ C03B *37/07***
**U.S. Cl. 65—3.12** **3 Claims**



1. A method of introducing a vapor stream into a rotating optical fiber preform tube, comprising the steps of:

(a) flowing a vapor stream comprised of a vaporized glass forming precursor entrained in an oxidizing carrier gas into the rotating optical fiber preform tube through an at least partially sealed rotary joint that has a tubular housing

supporting a ball bearing through which a tubular extension of the preform tube is journalled; and

(b) flowing a stream of the oxidizing carrier gas into the rotary joint housing, about the rotating preform tube extension and through the ball bearing to ambient air at a pressure greater than the pressure of the vapor stream as it flows through the rotary joint whereby ambient air is prevented from entering the vapor stream and any portion of the vapor stream from contaminating the ball bearing and escaping into ambient air should a leak occur in the sealed rotary joint.

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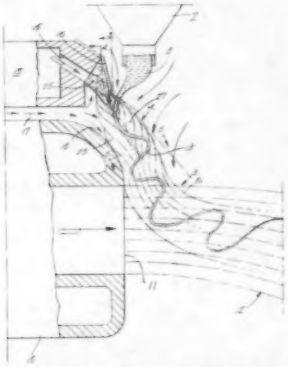
## 4,389,232
## APPARATUS FOR MAKING FIBERS FROM THERMOPLASTIC MATERIALS

**Rene Fournier, 310 Villa des Sapins, 60290 Vaux Sous Cambronne, Rantigny, and Daniel Sainte-Foi, St. Germer, 56 rue Maurice Duchemin, 60600 Clermont, both of France**

**Filed Feb. 5, 1982, Ser. No. 346,279**
**Int. Cl.³ C03D *37/04***
**U.S. Cl. 65—16** **11 Claims**



6. Equipment for use in fiberizing attenuable material comprising a blast generator having a gas flow passage and a discharge orifice with surrounding lips, one of which has an external convexly curved surface one edge of which extends transversely of the flow passage, jet generating means for delivering a jet in a path extending in tangent relation to a portion of said external convexly curved surface in a region spaced from the blast orifice with resultant Coanda deflection of the jet transversely into the blast, and means for delivering a stream of attenuable material in attenuable condition into the jet to be carried thereby into the blast.

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## 4,389,233
## PROCESS FOR THE PRODUCTION OF AN OPTICAL GLASS ARTICLE

**Shiro Kurosaki, and Minoru Watanabe, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Sep. 11, 1981, Ser. No. 301,895**
**Claims priority, application Japan, Sep. 17, 1980, 55-129817; Sep. 17, 1980, 55-129818**
**Int. Cl.³ C03C *15/02***
**U.S. Cl. 65—31** **37 Claims**

1. A process for producing an optical glass article, which comprises

preparing at least two solutions having a pH of 10 to 15 and an $SiO_2$ content of about 1 to 12 mols/l and containing at least one silicate selected from the group consisting of lithium polysilicate, sodium silicate, potassium silicate, rubidium silicate, cesium silicate, thallium silicate, quaternary ammonium silicate and colloidal silica,

combining these solutions to form a mixed solution,

reacting the mixed solution with at least one organic compound selected from the group consisting of formaldehyde, paraformaldehyde, formamide, glyoxal, methyl formate, ethyl formate, methyl acetate and ethyl acetate at a temperature from the freezing point to the boiling point of the reaction solution in a time sufficient to polymerize silica and form a porous gelled body,

leaching the porous gelled body with a leaching solution selected from the group consisting of water, an aqueous solution of an inorganic acid and an aqueous solution of an organic material, capable of dissolving residues in the porous gelled body, until the leaching reaches the central part of the porous gelled body, to form a porous glass body having micropores therein,

stuffing the porous glass body with a solution containing at least one compound capable of being converted into an oxide dopant for changing the refractive index of the porous glass body, selected from the group consisting of $CsNO_3$, $RbNO_3$ and $TlNO_3$,

unstuffing the porous glass body with a solvent or solution having a suitable composition at a suitable temperature to leach the compound out of the porous glass body so as to give a predetermined concentration distribution of the compound in the micropores,

precipitating the compound in the micropores,

drying the glass body in a predetermined atmosphere to decompose the compound,

further heating the glass body at a higher temperature, and

firing the glass body at a temperature sufficiently high to completely decompose the compound and to completely burn any organic materials in the glass body, but lower than the melting point of silica.

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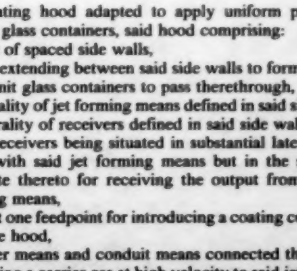
## 4,389,234
## GLASS COATING HOOD AND METHOD OF SPRAY COATING GLASSWARE

**Georg H. Lindner, Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.**

**Filed Mar. 18, 1982, Ser. No. 359,441**
**Int. Cl.³ C03C *17/00***
**U.S. Cl. 65—60.1** **22 Claims**



1. A coating hood adapted to apply uniform protective coatings to glass containers, said hood comprising:

(a) a pair of spaced side walls,

(b) a top extending between said side walls to form a tunnel to permit glass containers to pass therethrough,

(c) a plurality of jet forming means defined in said side walls,

(d) a plurality of receivers defined in said side walls,

(e) said receivers being situated in substantial lateral alignment with said jet forming means but in the side wall opposite thereto for receiving the output from said jet forming means,

(f) at least one feedpoint for introducing a coating compound into the hood,

(g) blower means and conduit means connected thereto for delivering a carrier gas at high velocity to said jet forming means with the coating compound entrained therein,

(h) said jet forming means being spaced longitudinally apart

a sufficient distance to issue a plurality of jets, half of them in one direction and the other half in opposite direction across the lateral dimension of the hood,

(i) whereby unreacted coating compound can be transferred from jet to jet along the longitudinal extent of said hood,

(j) said jet forming means and said receiver are divided into an inner loop and an outer loop,

(k) each loop comprising a pair of adjacent jet forming means,

(l) a pair of receivers disposed in alignment therewith,

(m) and conduit means connecting said jet forming means to said receivers so that at least two continuous loops are formed for recirculating the carrier gas with coating compound entrained therein.

**18**. A method for operating a coating hood to apply uniform protective coatings to heated glass containers, said spray hood comprising an entrance, an exit, and a tunnel region, a plurality of spaced carrier gas and entrained coating compound delivery means and receiving means in opposite sides of said tunnel, at least one feed point for introducing coating compound into said tunnel, said method comprising the steps of:

(a) passing glass containers through the tunnel,

(b) forming a circulating inner loop including a pair of jet forming means and suction slots, delivering

(c) coating compound to an inner circulating loop of carrier gas from which the unreacted compound is transferred to an outer loop of carrier gas,

(d) coating the container passing thereby.

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**4,389,235**

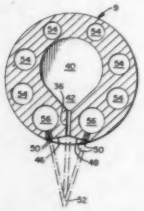
## BURNER FOR MANUFACTURE OF FUSED QUARTZ OR FUSED SILICA INGOTS

**Lothar Jung, 1355 Plymouth Rd., Bridgewater, N.J. 08807**

**Filed Feb. 5, 1982, Ser. No. 346,111**

**Int. Cl.³ C03B** *19/04*

**U.S. Cl. 65—302** **13 Claims**



**1**. A burner for producing an ingot from a particulate ingot-forming material by depositing and melting the particulate material on a rotating forming surface, said burner comprising:

an elongated, generally cylindrical body member having a hollow interior or bore for receiving the particulate material;

fuel supply means within said cylindrical body member;

orifice means for receiving fuel from said fuel supply means and establishing a line of flame along a length of said elongated body member; and

discharge means extending the length of said body member for distributing and discharging the particulate material simultaneously along a path generally coextensive with said orifice means, said discharge means being arranged with respect to said orifice means in a manner whereby the discharged particulate material passes through the flame and onto the rotating forming surface.

**4,389,236**

## HERBICIDAL 3-PHENOXYMETHYLENE-ANILINES

**Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

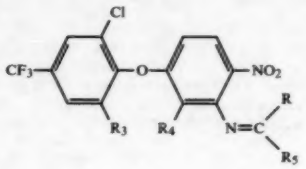
**Filed Aug. 3, 1981, Ser. No. 289,582**

**Claims priority, application Switzerland, Aug. 15, 1980, 6198/80**

**Int. Cl.³ A01N** *43/84, 43/40, 37/52;* **C07C** *123/00, 119/18;* **C07D** *295/18*

**U.S. Cl. 71—88** **14 Claims**

**1**. A compound of the formula



wherein

R is

or $C_1$–$C_4$ alkoxy,

one of $R_3$ and $R_4$ is hydrogen and the other is chlorine or hydrogen,

$R_5$ is hydrogen or $C_1$–$C_4$ alkyl,

$R_6$ is hydrogen, $C_1$–$C_4$ alkyl, $C_2$–$C_4$ alkenyl or $C_2$–$C_4$ alkynyl, and

$R_7$ is hydrogen or $C_1$–$C_4$ alkyl,

or $R_6$ and $R_7$ together with the nitrogen atom to which they are attached, can form a pyrrolidine, pyrroline, imidazolidine, pyrazolidine, piperidine, piperazine, morpholine, pyrazoline, imidazole, pyrrole or imidazoline ring.

**11**. A herbicidal composition which comprises (1) a herbicidally effective amount of a compound according to claim **1** and (2) a carrier.

**12**. A method of selectively controlling weeds in crops of useful plants, which comprises applying to said crops a herbicidally effective amount of a compound according to claim **1**.

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**4,389,237**

## THIOLCARBAMATE SULFOXIDES PROTECTED AGAINST DRY SOIL DEACTIVATION

**Gilbert G. Patchett, Richmond; Reed A. Gray, Saratoga, both of Calif., and Daniel L. Hyzak, Austin, Tex., assignors to Stauffer Chemical Company, Westport, Conn.**

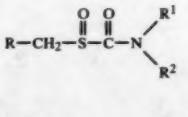
**Filed Sep. 23, 1981, Ser. No. 304,539**

**Int. Cl.³ A01N** *41/00*

**U.S. Cl. 71—103** **15 Claims**

**1**. A herbicidal composition comprising combining

(a) about 10 to about 90 percent by weight of a thiolcarbamate sulfoxide of the formula



in which

R is alkyl $C_1$–$C_7$, haloalkyl $C_1$–$C_5$, alkoxy $C_1$–$C_5$ and phenyl;

$R^1$ and $R^2$ independently are alkyl $C_1$–$C_6$, cycloalkyl $C_3$–$C_8$, alkenyl $C_2$–$C_6$ and alkynyl $C_2$–$C_4$; or

$R^1$ and $R^2$ together form an alkylene ring having 4 to 7 carbon atoms optionally substituted with one or two $C_1$–$C_4$ alkyl groups and preferably $R^1$ and $R^2$ together with the nitrogen atom to which they are attached form piperidino, hexamethyleneimino, decahydroquinolyl, 2,5-dimethylpiperidino and 5-ethyl-2-methylpiperidino; and

(b) about 90 to about 10 percent by weight of neohexanoic acid, phosphoric acid, benzoic acid, lactic acid or their sodium or potassium salts.

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**4,389,238**

## FLOWABLE HERBICIDE AND PESTICIDE FORMULATION

**Harold A. Kaufman, Piscataway, N.J., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.**

**Continuation of Ser. No. 143,368, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 925,194, Jul. 18, 1978, abandoned. This application Nov. 9, 1981, Ser. No. 319,558**

**Int. Cl.³ A01N** *37/10, 37/38*

**U.S. Cl. 71—115** **10 Claims**

1. A flowable toxicant composition comprising (a) an effective amount of a water-insoluble active pesticide in its free acid form having a herbicide size of from about 2 to about 5 microns average particle diameter and (b) from about 5 to about 30% by weight unreactive aluminum hydroxide gel containing about 2 to 20% by weight aluminum hydroxide which has been rendered unreactive by heating at an elevated temperature with mixing for sufficient time to effect its conversion to unreactive gel without loss of its suspending properties.

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**4,389,239**

## METHOD AND PRESSURE CONTAINER FOR PRODUCING HYDROGEN-STORAGE METAL GRANULATES

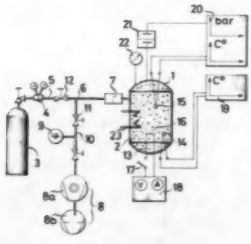
**Karl-Heinz Klatt, Jülich; Siegfried Pietz, Dortmund, and Helmut Wenzl, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany**

**Filed Jun. 9, 1981, Ser. No. 272,055**

**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022708**

**Int. Cl.³ B22F** *9/00*

**U.S. Cl. 75—0.5 R** **11 Claims**




1. A method of activating a metal granulate of a kind suitable for storage of hydrogen in a pressure vessel, comprising the steps of:

admixing a minor amount of an easily activatable hydrogen-storing metal granulate to a mass of a metal granulate selected for its hydrogen storage capability rather than for its ease of activation;

evacuating the resulting mixture of said granulates in a pressure vessel, and

introducing hydrogen into said pressure vessel at a temperature at which said easily activatable metal granulate is capable of activation until the pressure in said vessel reaches a pressure of the order of magnitude of 50 bar,

whereby the heat developed by activation of said easily activatable granulate builds up and initiates activation of all the granulate material of said mixture.

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**4,389,240**

## ALLOYING METHOD

**Donald L. Erich, Warwick; Alfred J. Varall, Jr., Middletown, and Stephen J. Donachie, New Windsor, all of N.Y., assignors to Novamet, Inc., Wyckoff, N.J.**

**Filed Jul. 9, 1982, Ser. No. 396,892**

**Int. Cl.³ C22C** *1/04, 21/20*

**U.S. Cl. 75—0.5 B** **4 Claims**

1. A process for producing a readily powderable, agglomerated metallurgical composition comprising contacting a mass of flowable powder of a metal or alloy having a melting point of at least about 500° C. with a lesser mass of alkali metal at a temperature above the melting point of said alkali metal and below the melting point of said metal or alloy while under a protective gaseous atmosphere and while kneading said contacting metals for a time sufficient to thereby form agglomerates of substantially uniform composition of said contacting metals.

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**4,389,241**

## PROCESS FOR PRODUCING LITHIUM-METAL MASTER ALLOY

**Robert D. Schelleng, Suffern, N.Y., assignor to Novamet, Inc., Wyckoff, N.J.**

**Filed Aug. 30, 1982, Ser. No. 412,546**

**Int. Cl.³ C22C** *1/04, 21/20*

**U.S. Cl. 75—0.5 R** **6 Claims**

1. In the process of sorbing a molten alkali metal in and onto a powder of a secondary metal, the improvement comprising employing as said powder of said secondary metal a powder which has been subjected to mechanical milling so as to have achieved in said powder substantial saturation hardness and a stable microfine grain size.

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**4,389,242**

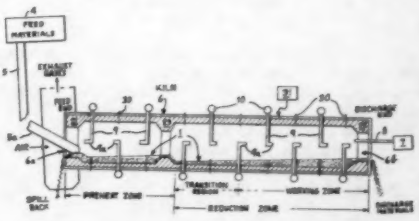
## INTERIOR ARRANGEMENT FOR DIRECT REDUCTION ROTARY KILNS AND METHOD

**Alan C. Baker, Harriman, Tenn.; Geoffrey N. Boulter, New York, N.Y., and Daniel H. Wilbert, Knoxville, Tenn., assignors to The Direct Reduction Corporation, New York, N.Y.**

**Filed Mar. 18, 1982, Ser. No. 359,439**

**Int. Cl.³ C21B** *13/08;* **F27B** *7/30*

**U.S. Cl. 75—20 R** **10 Claims**




1. In an inclined rotary kiln of the type for directly reducing metal oxides using a solid carbonaceous material as the source of fuel and reductant, and having an opening at the higher end for receiving the metal oxides materials as a charge along with a portion of the solid carbonaceous materials, and an opening at the lower end for receiving the remainder of the solid carbonaceous materials and for discharging the reduced materials therefrom and wherein the kiln interior wall defines a process operating zone bounded by a feed end dam located at the higher end of the kiln and a discharge end dam located at the

lower end through which zone the bed of charge materials moves, the improvement comprising:

intermediate dam means, disposed within the kiln between the feed end and discharge end dams at a location about one-third the distance along the length of the kiln from the feed end dam, for dividing the operating zone into a preheat zone between said dam means and the feed end dam and a reduction zone between said dam means and the discharge end dam, said dam means being dimensioned to provide volume filling and residence time of the bed materials in said preheat zone sufficient to permit the transfer of adequate heat thereto at the available rate of heat transfer through the surface of the bed in said preheat zone to raise the temperature of the materials to a level approaching the reduction temperatures of the metal oxides by the time the materials reach the end of said preheat zone in their movement through the kiln.

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## 4,389,243

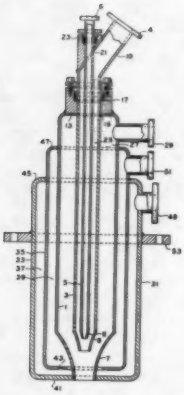
## METHOD FOR THE FLASH OXIDATION OF METAL CONCENTRATES

**Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.**

**Division of Ser. No. 38,322, May 11, 1979, Pat. No. 4,249,722. This application Oct. 17, 1980, Ser. No. 197,967**

**Int. Cl.³ C22B 5/12**

**U.S. Cl. 75—23** **2 Claims**



1. A method of operating a burner for use in the flash oxidation of metal concentrates having three concentrically mounted tubes each with a venturi nozzle on the discharge end thereof, said method comprising the steps of:

introducing an oxidizing gas into the annular space between the intermediate tube and the outer tube such that the velocity of this gas is increased as it is ejected by the nozzle on the discharge end of the outer tube;

introducing particles of metal concentrates into the annular space between the inner tube and the intermediate tube with the nozzle at the end of said intermediate tube partially extending axially into the nozzle on the end of the outer tube, such that the metal concentrates are intensely mixed with the oxidizing gas by the outer tube nozzle; and

introducing an additional oxidizing gas into the inner tube with the nozzle at the end thereof extending partially into the nozzle at the end of the intermediate tube, said additional oxidizing gas being introduced at a pressure sufficiently above that at which the oxidizing gas is introduced into the outer tube such that the particles of metal concentrate are accelerated by said additional oxidizing gas to substantially the velocity of the oxidizing gas introduced into the outer tube at the nozzle on the discharge end of the outer tube.

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## 4,389,244

## METHOD OF SUPPLYING PULVERIZED FUEL MIXTURE TO BLAST FURNACE TUYERES

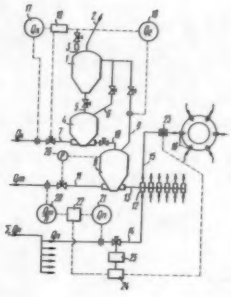
**Stanislav L. Yaroshevsky, ulitsa Schorsa, 25, kv. 6; Leonid F. Lukyanchenko, ulitsa 50-letia SSSR, 108, kv. 172; Grigory N. Sidorenko, ulitsa Artekovskaya, 9; Evgeny N. Skladanovsky, ulitsa 50-letia SSSR, 108, kv. 40; Mikhail A. Zalevsky, ulitsa Kuibysheva, 61, kv. 17; Viktor I. Machikin, ulitsa Kuibysheva, 2, kv. 87, all of Donetsk; Jury G. Bannikov, ulitsa Lenina, 64, kv. 47, Kharkov; Anatoly I. Ryabenko, ulitsa Prozhektornaya, 18, kv. 30, Donetsk; Shamil T. Okazov, ulitsa Schorsa, 6, kv. 25, Donetsk; Vasily V. Stepanov, bulvar Shevchenko, 6, kv. 24, Donetsk; Evgeny A. Danilin, ulitsa Petrozavodskaya, 95, kv. 10, Kharkov; Anatoly A. Yarmal, bulvar Shkolny, 18, kv. 61, Donetsk; Grigory E. Nekhaev, ulitsa Zhabeleva, 26, Donetsk; Jury I. Bat, prospekt Vatutina, 43, kv. 44, Donetsk; Nikolai N. Popov, ulitsa Krymskaya, 7, Donetsk; Alexei M. Kamardin, bulvar Pushkina, 95, kv. 25, Donetsk; Valdimir P. Tereschenko, bulvar Shevchenko, 10, kv. 55, Donetsk, and Romualda S. Stankevich, ulitsa Bogomoltsa, 7/14, kv. 156, Kiev, all of U.S.S.R.**

**PCT No. PCT/SU80/00218, § 371 Date Jan. 11, 1982, § 102(e) Date Jan. 11, 1982, PCT Pub. No. WO81/03341, PCT Pub. Date Nov. 26, 1981**

**PCT Filed Dec. 25, 1980, Ser. No. 342,004**

**Int. Cl.³ C21B 5/00**

**U.S. Cl. 75—42** **4 Claims**



1. A process for supplying a pulverized fuel mixture to a plurality of blast furnace tuyeres, comprising the steps of:

batch loading the pulverized fuel mixture into a discharge chamber;

maintaining substantially gauge pressure within said discharge chamber;

discharging said fuel mixture from said discharge chamber into a main carrier gas flowing toward said tuyeres to provide a flow of fluidized pulverized fuel mixture;

dividing said flow into a corresponding plurality of main carrier gas streams, one of said streams flowing to each of said tuyeres; and

providing a corresponding plurality of supplementary carrier gas streams; and

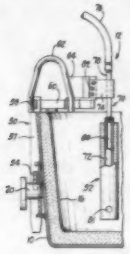
introducing each of said supplementary carrier gas streams into a corresponding one of said main carrier gas streams to form a corresponding plurality of combined gas streams, the total flow rate of all of said supplementary carrier gas streams being 3 to 10 times the total flow rate of said main carrier gas; and

maintaining the product of the total flow rate of each of said combined streams by the concentration of pulverized fuel mixture therein, the same for all of said combined streams.

## 4,389,245
## LANCE LADLING

Matthew J. Blair, Niles; Thomas A. Wiktorowski, Parma Heights, and W. Dale Wogan, Warren, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 165,709, Jul. 3, 1980, This application Oct. 14, 1981, Ser. No. 311,175
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 16 Claims



1. In a process of injecting ladle additives into molten steel, the steps comprising:
transferring molten steel into a vessel;
entraining a particulate additive in a gas flow;
supporting on the vessel a refractory-protected conduit of constant length having an unobstructed opening positioned at a fixed location within the vessel,
introducing the gas flow and additive below the surface of the steel at a constant level within the vessel through said conduit while the molten steel is being transferred into the vessel; and
continuing the introduction of gas flow and additive into the vessel at said level until a predetermined quantity of additives has been introduced.

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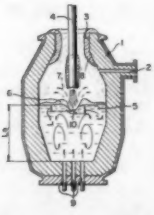
## 4,389,246
## GASIFICATION PROCESS OF SOLID CARBONACEOUS MATERIAL

Shozo Okamura, Asomachi; Hidemasa Nakajima; Katsukiyo Marukawa, both of Ibaraki; Shoji Anezaki, Ibaraki, and Takeyuki Hirata, Ibaraki, all of Japan, assignors to Sumitomo Metal Industries, Osaka, Japan

Filed Aug. 6, 1981, Ser. No. 290,587
Claims priority, application Japan, Dec. 2, 1980, 55-170170
Int. Cl.³ C21C 5/32
U.S. Cl. 75—60 19 Claims



1. A process for gasification of solid carbonaceous material in which pulverized solid carbonaceous material is top-blown onto a molten iron bath stored in a furnace through a non-submerged lance toward a hot spot formed by means of a jet of a gasifying agent comprising at least oxygen, the gasifying agent is top-blown through a non-submerged lance, the solid carbonaceous material being blown by means of a carrier gas, thereby the solid carbonaceous material being gasified, wherein the improvement comprises that the ratio $L/L_0$ of the depression depth L of the molten iron bath to the molten iron bath depth $L_0$ is maintained from 0.05 to 0.15, and the blowing velocity of the solid carbonaceous material is maintained from 50 to 300 m/sec so as to suppress the forming of an adhered mass in the furnace, and a stirring gas is blown through at least one nozzle which opens below the level of the molten iron bath to stir the molten iron bath.

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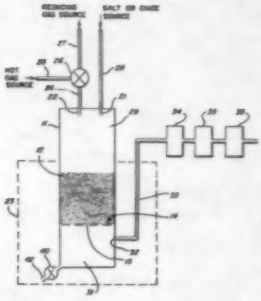
## 4,389,247
## METAL RECOVERY PROCESS

Sungkuk Won, and Jerry E. Dobson, both of Tucson, Ariz., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 29, 1982, Ser. No. 362,956
Int. Cl.³ C22B 15/00
U.S. Cl. 75—72 20 Claims



1. A process for recovering a metal in its elemental state by reducing an oxide or salt of the metal with a reducing gas, comprising:
providing a reaction vessel containing a packed bed of a packing material which is substantially chemically inert under the conditions in the reaction vessel and whose melting point is higher than the temperature at which the packed bed is maintained, the packing material being packed so as to provide void spaces in the bed through which fluid flow of the oxide or salt, reducing gas and any elemental metal formed through the bed and in intimate contact with each other and with the packing material is permitted;
maintaining the temperature of the packed bed above the melting point of the metal in its elemental state and at a level at which substantial reduction of the metal in its oxide or salt occurs by reaction of the oxide or salt with the reducing gas;
introducing the metal oxide or salt and the reducing gas into the reaction vessel wherein the metal oxide or salt and reducing gas react to form the metal in its elemental state and passing a reaction mixture comprising the elemental metal formed, any gaseous product formed, any unreacted reducing gas and any unreacted fluid metal oxide or salt downward through the void spaces within the packed bed so as to effect intimate contact between the unreacted fluid metal oxide or salt, the unreacted reducing gas and the packed bed to thereby promote heat transfer therebetween and reaction of the unreacted fluid metal oxide or salt with the unreacted reducing gas, and so as to effect intimate contact of the elemental metal formed and the packed bed to thereby promote coalescence within the packed bed of the elemental metal formed;
permitting the reaction mixture to remain within the packed bed sufficiently long that reaction between the metal oxide or salt and the reducing gas and coalescence of the elemental metal formed are substantially complete by the

time the reaction mixture passes out of the packed bed; and

collecting within the reaction vessel and below the packed bed any coalesced elemental metal passing out of the packed bed.

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**4,389,248**

## METHOD OF RECOVERING GOLD FROM ANODE SLIMES

**Toshimasa Iio, and Toyokazu Ohkubo, both of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan**

**Filed Nov. 2, 1981, Ser. No. 317,640**

**Claims priority, application Japan, Nov. 18, 1980, 55/162153**

**Int. Cl.³ C22B *11/00***

**U.S. Cl. 75—99** **18 Claims**

**1.** A method of recovering gold from anode slimes generated during electrolytic copper refining, said method comprising the steps of

(1) removing copper and selenium from said anode slimes;

(2) adding exclusively water to the anode slimes from which the copper and selenium have been removed in step (1) in order to form an aqueous slurry;

(3) blowing exclusively chlorine gas into said aqueous slurry of step (2) to dissolve the gold; and

(4) separating said dissolved gold from the residue.

**17.** A method as set forth in claim **1**, further including treating said dissolved gold obtained in step (4) with a reducing agent to obtain high purity gold as a precipitate.

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**4,389,249**

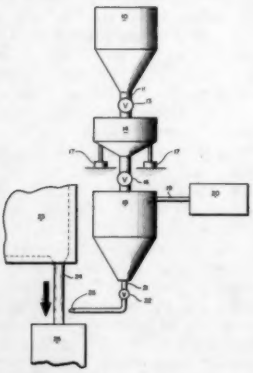
## METHOD FOR ADDING INGREDIENT TO STEEL AS SHOT

**Michael O. Holowaty, Crown Point; Ian F. Hughes, Munster, and John Lude, Portage, all of Ind., assignors to Inland Steel Company, Chicago, Ill.**

**Filed Apr. 22, 1982, Ser. No. 370,908**

**Int. Cl.³ C22C *37/00***

**U.S. Cl. 75—129** **11 Claims**



**1.** In a process wherein alloying ingredients are added as shot to molten steel which is flowed from a ladle to a casting mold, a method for enhancing the recovery and uniformity of distribution in said steel of said alloying ingredients, said method comprising:

employing a shot size within the range 0.5–2.0 mm, (0.019–0.078 in.) with no more than about 1 wt.% outside said size range;

and feeding said shot into said molten steel without mechanical hurling.

**4,389,250**

## MEMORY ALLOYS BASED ON COPPER OR NICKEL SOLID SOLUTION ALLOYS HAVING OXIDE INCLUSIONS

**Keith Melton, Busslingen; Olivier Mercier, Ennetbaden, and Helmut Riegger, Busslingen, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Mar. 2, 1981, Ser. No. 239,646**

**Claims priority, application European Pat. Off., Mar. 3, 1980, 80200185.9**

**Int. Cl.³ F16G *1/26***

**U.S. Cl. 75—232** **8 Claims**

**1.** A memory alloy prepared by powder metal technology consisting essentially of aluminum and at least one metal selected from the group consisting of copper, nickel, or copper and nickel having the $\beta$-phase solid solution structure which forms a matrix having a fine grained texture with a crystallite diameter of at most 100 $\mu$m, the Cu/Al or Cu/Al/Ni alloy containing Al in the range of 10.6–15.0 percent, and Ni in the range of 0–6 percent, the balance being copper, and the Ni/Al alloy containing Al in the range of 17–26%, the balance being Ni, and, dispersed in said matrix, 0.5 to 2.0 percent of finely divided inclusions of at least one metal oxide having a particle size of 1.0 nm to 1.0 micron.

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**4,389,251**

## POWDER MIXTURE FOR THERMAL SPRAYING

**Wolfgang Simm, Lausanne; Hans-Theo Steine, Chavannes, and Daniel Audemars, Echandens, all of Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland**

**Filed Jan. 14, 1981, Ser. No. 225,047**

**Claims priority, application Switzerland, Jan. 17, 1980, 386/80**

**Int. Cl.³ B22F *1/00***

**U.S. Cl. 75—255** **36 Claims**

**1.** A spraying powder for producing, by thermal spraying on a substrate, a heterogenous layer characterized by a lamellar structure comprising juxtaposed lamellae formed from at least two different alloy powders, said spraying powder comprising a mechanical mixture of said at least two different alloy powders, said at least two different alloy powders being selected from the group consisting of a boron-free nickel and/or a cobalt and/or an iron-base alloy, wherein the hardness of each of said alloys is compared in similar as-cast form, or a similar sprayed-on coating form, and wherein each has a different hardness ranging from 200 to 650 Hv and a different static coefficient of friction in the range from 0.01 to 0.3 $\mu_S$, said hardness difference between the selected alloys being at least 30 Hv.

**20.** A spraying powder for producing, by thermal spraying on a substrate, a heterogeneous layer characterized by a lamellar structure comprising juxtaposed lamellae formed from at least two different alloy powders, said spraying powder comprising a mechanical mixture of said at least two different alloy powders, said at least two different alloy powders being selected from the group consisting of a boron-free nickel and/or a cobalt and/or an iron-base alloy, the hardness of a first alloy in an as-cast form, or a sprayed-on coating form, of the said alloy powder mixture being within the range of 200 to 450 Hv, and the hardness of a second alloy in similar as-cast form, or a similar sprayed-on coating form, of the said alloy powder mixture being within the range of 350 to 650 Hv, the difference in hardness between the said first and second alloys being at least 30 Hv, and at least one of said first and second alloys being selected from alloys which undergo a modification in structure during the spraying operation.

**4,389,252**

## PLANT FOR MANUFACTURING CEMENT CLINKER

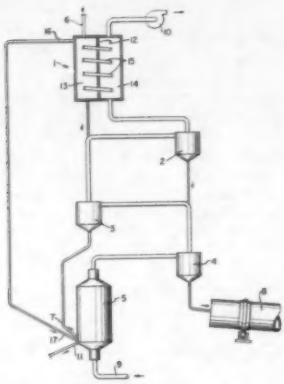
**Rolf D. Houd, and Hans B. Knudsen, both of Copenhagen, Denmark, assignors to F. L. Smidth & Co., Cresskill, N.J.**

**Filed Dec. 3, 1980, Ser. No. 212,401**

**Claims priority, application United Kingdom, Dec. 12, 1979, 7942891**

**Int. Cl.³ C04B 7/02**

**U.S. Cl. 106—100** **9 Claims**



1. An apparatus for use with a kiln for manufacturing cement clinker comprising at least one multi-stage preheater for passage of cement raw material therethrough, the raw material having volatile, combustible components, said at least one multi-stage preheater having at least one cyclone stage heated by exit gases, means provided in at least one preheater stage for separating the cement raw material from said exit gases, and means for transferring heat indirectly from said exit gases to the cement raw material in such a manner that the volatile, combustible components are expelled from the cement raw material without explosion of said volatile, combustible components.

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**4,389,253**

## PROCESS FOR REMOVING CRUD FROM ION EXCHANGE RESIN

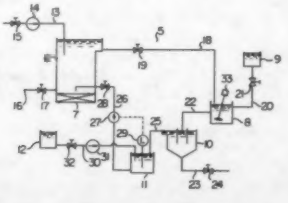
**Shigeoki Nishimura, Katsuta; Toshio Ogawa, Takahagi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 28, 1981, Ser. No. 315,736**

**Claims priority, application Japan, Oct. 30, 1980, 55-153358; Dec. 8, 1980, 55-172036**

**Int. Cl.³ B08B 3/12**

**U.S. Cl. 134—1** **16 Claims**



1. A process for removing crud adsorbed on ion exchange resin and separating the ion exchange resin from the crud comprising:

providing a slurry comprising ion exchange resin having crud adsorbed thereon;

supersonically irradiating the slurry to excoriate and remove the crud from the surface of the ion exchange resin and to float the excoriated crud to the surface of the slurry;

reacting a dispersing agent with the excoriated crud to form a dispersed and stabilized colloid by charging the surface of the crud either positively or negatively to prevent the crud from readsorbing on the ion exchange resin due to static attraction; and

separating a slurry containing the dispersed and stabilized colloid from the ion exchange resin from which the crud has been removed.

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**4,389,254**

## CONTINUOUS TREATMENT OF STEEL SHEET

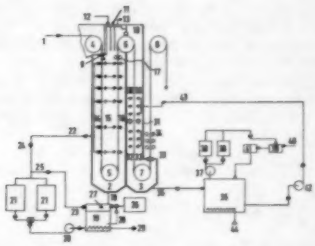
**Vittorino Tusset, Oupeye; Jules Hancart, Jupille, and Philippe Paulus, Liege, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium**

**Continuation of Ser. No. 87,639, Oct. 23, 1979, abandoned. This application Apr. 28, 1981, Ser. No. 258,480**

**Claims priority, application Belgium, Oct. 27, 1978, 871631**

**Int. Cl.³ C23G 1/08**

**U.S. Cl. 134—3** **10 Claims**



1. A process for the continuous treatment of steel sheet, comprising the sequential steps of:

thermally treating the steel sheet to form an oxide layer on its surface;

pickling the sheet having the oxide layer by bringing the sheet into contact with a solution of formic acid, the solution having an iron content of at least 50 mg/l, while maintaining the pH of the solution between 1.5 and 4, and maintaining the temperature of the solution both above 40° C. and above a minimum value $T_m$ in C.° given by the equation

$$T_m = 20 + (\text{pH of solution} - 1.5)32;$$

and

adding hydrogen peroxide oxidizing agent to the solution, while maintaining the concentration of the oxidizing agent in the solution between a minimum value equal to the value necessary to oxidize at least 80% of the ferrous ions in solution to ferric ions and a maximum value of up to ten times the minimum value wherein, the formic acid pickling solution is self-regenerating by the sequential steps of,

reacting the formic acid with the ferrous oxide coating of the sheet to yield ferrous formiate and water,

reacting the ferrous formiate, the hydrogen peroxide oxidizing agent which is added, and the formic acid together to form ferric formiate and water, and

producing a hydrolysis reaction between the ferric formiate and the water to regenerate the formic acid and produce a ferric hydroxide precipitate;

removing the ferric hydroxide precipitate from the pickling solution, and

recycling the regenerated formic acid.

4,389,255

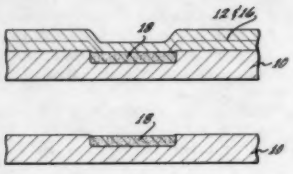
## METHOD OF FORMING BURIED COLLECTOR FOR BIPOLAR TRANSISTOR IN A SEMICONDUCTOR BY SELECTIVE IMPLANTATION OF POLY-SI FOLLOWED BY OXIDATION AND ETCH-OFF

Chau-Shiong Chen, and Anant O. Dixit, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 111,683, Jan. 14, 1980, abandoned, which is a continuation of Ser. No. 3,652, Jan. 15, 1979, abandoned. This application Nov. 13, 1980, Ser. No. 206,350

Int. Cl.[3] H01L *21/265, 21/225*

U.S. Cl. 148—1.5 1 Claim




1. A process for producing a buried collector for a bipolar transistor in a semiconductor body comprising:

applying a dopant impermeable oxide masking layer onto the surface of said semiconductor body, said masking layer having a window therein which exposes the surface of said substrate where said collector is to be fabricated;

applying a polysilicon layer uniformly over said masking layer and said exposed surface of said substrate;

implanting dopant ions into said polysilicon layer and thereafter diffusing said implanted dopant ions from said polysilicon layer through said window into a relatively deep region of said semiconductor body under said window;

oxidizing said polysilicon layer and a relatively shallow surface portion of said deep region into which said dopant ions diffused so as to form a single integrated oxide layer out of said masking layer and said polysilicon layer and said surface portion of said deep region; and

removing said single integrated oxide layer in a single step while retaining the remaining portion of said deep region into which said dopant atoms diffused as said buried collector.

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4,389,256

## METHOD OF MANUFACTURING PN JUNCTION IN GROUP II-VI COMPOUND SEMICONDUCTOR

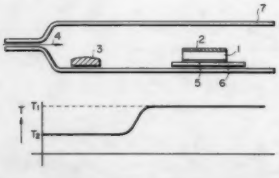
Jun-ichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi-ken, and Kazuomi Ito, Ashikaga, both of Japan, assignors to Jun-ichi Nishizawa, Sendai, Japan

Filed Jun. 5, 1981, Ser. No. 270,816

Claims priority, application Japan, Jun. 16, 1980, 55-81212

Int. Cl.[3] H01L *21/324*

U.S. Cl. 148—1.5 14 Claims




1. A method of manufacturing a pn junction with a II-VI compound semiconductor selected from ZnSe, CdS and ZnS, said method comprising:

controlling the vapor pressure of that component element of the compound semiconductor having a higher vapor pressure than the other component element, to a predetermined level during crystal growth by the temperature difference liquid crystal growth method, thereby producing a II-VI compound semiconductor mono-crystal; and

doping an acceptor impurity under controlled temperature conditions such that the stoichiometry of the mono-crystal remains substantially constant and the density of the donor level is not greater than the density of the acceptor impurity added.

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4,389,257

## FABRICATION METHOD FOR HIGH CONDUCTIVITY, VOID-FREE POLYSILICON-SILICIDE INTEGRATED CIRCUIT ELECTRODES

Henry J. Geipel, Jr., Essex Junction, Vt.; Ning Hsieh, San Jose, Calif.; Charles W. Koburger, III, Underhill, and Larry A. Nesbit, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,608

Int. Cl.[3] H01L *21/285*

U.S. Cl. 148—1.5 15 Claims

1. The method of providing self-passivated composite silicon-silicide conductive electrodes for field effect devices including the steps of:

providing a semiconductor substrate of a first conductivity type;

providing a gate dielectric layer on said substrate;

providing a conductive first silicon layer on said gate dielectric layer;

sequentially depositing over said first silicon layer a layer comprising a silicide-forming metal and a second silicon layer, and

exposing said layered structure to a thermally oxidizing atmosphere to grow a predetermined thickness of silicon dioxide on said structure;

the improvement characterized in that the step of depositing said silicide-forming metal includes the simultaneous co-deposition of silicon and said silicide-forming metal in a substantially stoichiometric ratio to form an alloy layer having the composition of an intermetallic metal compound silicide and that the thickness of said second silicon layer provides between 30 and 100 percent of the silicon required to grow said predetermined thickness of silicon dioxide during said oxidation step, the balance of the silicon required to grow said predetermined thickness being provided by said first silicon layer.

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4,389,258

## METHOD FOR HOMOGENIZING THE STRUCTURE OF RAPIDLY SOLIDIFIED MICROCRYSTALLINE METAL POWDERS

James Dickson, Stirling; Kenji Okazaki, Rockaway Township, Morris County, both of N.J., and Thomas H. Sanders, Lafayette, Ind., assignors to Allied Corporation, Morris Township, N.J.

Filed Dec. 28, 1981, Ser. No. 334,624

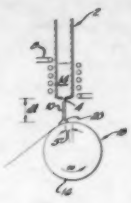
Int. Cl.[3] B22F *9/08, 9/04*

U.S. Cl. 148—3 8 Claims

1. An improved method for producing rapidly solidified aluminum alloy powder from material which has been quenched on a chill surface, the material having regions with coarse microstructure and regions with fine microstructure, the improvement comprising:

grinding said material to develop a fractured powder having a coarse powder component with said coarse microstruc-

ture and a fine powder component with said fine microstructure; and



screening said powder to remove said coarse powder component.

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**4,389,259**

## ASYMMETRICAL DIESTERS OF ORTHOPHOSPHORIC ACID USEFUL AS CORROSION INHIBITORS

**Bernard Danner, Riedisheim, France; Hartmut Mau, Istein, Fed. Rep. of Germany, and Hans Stettler, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland**

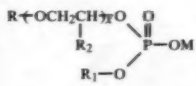
**Filed Apr. 24, 1981, Ser. No. 257,379**

**Claims priority, application Switzerland, Apr. 30, 1980, 3345/80; Jun. 20, 1980, 4756/80; Jan. 9, 1981, 126/81**

**Int. Cl.³ B05D *7/14*; C23F *11/16***

**U.S. Cl. 148—6.15 R** **15 Claims**

1. A process for the inhibition of oxidative corrosion of metals in the presence of weakly acidic to weakly basic electrolytes comprising the step of contacting the metal with an effective amount of a compound of formula I:



I

in which

R is $C_{8-18}$alkyl,

$R_1$ is $C_{2-4}$alkyl,

$R_2$ is hydrogen or methyl,

x is 1–15, and

M is hydrogen, an alkali metal ion or an equivalent of an alkaline earth metal or zinc ion.

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**4,389,260**

## COMPOSITION AND PROCESS FOR THE PHOSPHATIZING OF METALS

**Dieter Hauffe, Frankfurt am Main; Gerhard Muller, Hanau am Main; Werner Rausch, Oberursel; Josef Rothkegel, Maintal, and Gudrun Volling, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.**

**Filed Jan. 8, 1982, Ser. No. 337,916**

**Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101866**

**Int. Cl.³ C23F *7/08***

**U.S. Cl. 148—6.15 Z** **10 Claims**

1. A composition for the phosphatising of metals which comprises an aqueous acidic chlorate-containing zinc phosphate solutions which contains:

from 0.5 to 1.5 g/liter Zn

from 0.4 to 1.3 g/liter Ni

from 10 to 26 g/liter $P_2O_5$

from 0.8 to 5 g/liter $ClO_3$

and is free of nitrite and in which the weight ratio of Zn to Ni is adjusted to a value of 1:0.5 to 1.5, that of Zn to $P_2O_5$ to a value of 1:8 to 85 and that of free $P_2O_5$ to total $P_2O_5$ to a value of 0.005 (at about 30 degrees C.) to 0.06 (at about 60 degrees C.):1.

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**4,389,261**

## PROCESS FOR CUTTING METAL MEMBERS BY MEANS OF JETS OF GAS WHICH ISSUE AT THE PERIPHERY OF A ROTARY DISC

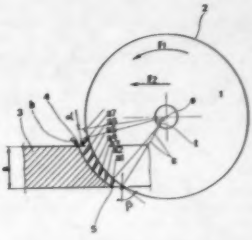
**Michel Donze, Liverdun, and Severino Rugi, Moyeuvre Grande, both of France, assignors to Etablissements Somalor-Ferrari 'Somafer', Uckange, France**

**Filed Jul. 1, 1982, Ser. No. 394,172**

**Claims priority, application France, Jul. 10, 1981, 81 14041**

**Int. Cl.³ B23K *7/02***

**U.S. Cl. 148—9 R** **2 Claims**



1. A process for cutting metal members by means of jets of gas such as oxygen emitted at the periphery of a distributor disc rotating about its axis of revolution, the jets being directed in the plane of symmetry of the disc each being at an angle of less than 90° to the tangent to the disc, which is drawn from the intersection of the axis of the jet with the periphery of the disc, characterized in that the disc is rotated in the opposite direction to the tangential component of the jets.

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**4,389,262**

## AMORPHOUS ALLOYS OF NICKEL, ALUMINUM AND BORON

**Lee E. Tanner, Berkeley, Calif., assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Dec. 31, 1980, Ser. No. 221,941**

**Int. Cl.³ C22C *19/03***

**U.S. Cl. 148—403** **3 Claims**

1. An amorphous nickel-base alloy containing aluminum and boron and having an ultimate tensile strength in excess of $3\times10^9$ Pa, the alloy consisting essentially of a composition which, when plotted on a ternary phase diagram in atomic percent Ni, atomic percent Al and atomic percent B, is represented by a quadrilateral region having at its corners the points defined by:

(1) Ni-62, B-33, Al-5;

(2) Ni-73, B-22, Al-5;

(3) Ni-62, B-13, Al-25; and

(4) Ni-52, B-23, Al-25.

**4,389,263**

## BONDING AGENT FOR NITRAMINES IN ROCKET PROPELLANTS

**Henry C. Allen, Decatur, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 9, 1981, Ser. No. 310,173**
**Int. Cl.³ C06B *45/22***
**U.S. Cl. 149—11** **17 Claims**

1. In a propellant composition comprised of about 41 weight percent binder selected from a first binder consisting of mixed polyesters, nitrocellulose, and a diisocyanate curing agent plasticized with 70/30 weight percent blend of nitroglycerine and butanetrioltrinitrate, or a second binder consisting of polymers of ethylene oxide and polymers of caprolactone, cellulose acetate butyrate crosslinker, and a polyfunctional isocyanate curing agent plasticized with mixed nitrate esters consisting of about equal amounts of butanetrioltrinate, triethyleneglycoldinitrate, and trimethylolpropanetrinitrate; and including the additional propellant ingredients employed with said binder system selected of about 3 weight percent of fine particle solids which function as stabilizers, ballistic modifiers, and opacifiers, and about 56 weight percent of a nitramine oxidizer powder selected from the nitramine oxidizers consisting of cyclotetramethylenetetranitramine and cyclotrimethylenetrinitramine, said nitramine oxidizer powder consisting of particle sizes ranging from about 3 micrometers and larger, said larger nitramine oxidizer powder being coated, the improvement to propellant properties achieved by employing a prior coating process to effect a coating on said larger nitramine oxidizer powder of a collagen protein derived from animal source prior to incorporating said selected nitramine oxidizer powder into said propellant composition, said coated nitramine oxidizer powder having a collagen protein coating from about 0.25 weight percent to about 1.25 weight percent which functions as a bonding agent to enhance the bond strength between the propellant binders and nitramine particles to thereby result in substantial enhancement of desirable propellant properties including tensile strength, and initial tangent modulus.

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**4,389,264**

## PROCESS FOR THE MANUFACTURE OF INSULATED PROPELLANT SETS AND OF PROPELLING SETS PROVIDED WITH AN INSULATING ENVELOPE

**Wolfgang H. R. Klöhn, Pfinztal; Dieter H. Müller, Karlsruhe, and Hiltmar A. O. Schubert, Walzbachtal, all of Fed. Rep. of Germany, assignors to s.a. PRB, societe anonyme, Belgium**

**Filed Feb. 17, 1981, Ser. No. 234,604**
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006418**
**Int. Cl.³ C06B *45/12***
**U.S. Cl. 149—14** **10 Claims**

1. Process for the manufacture of insulated propellant sets for base-bleed gas generators comprising introducing a propellant containing one or more solid substances, at least one of which is an oxidant, and a binder comprising a thermoplastically deformable elastomer, into an insulating envelope, which contains a thermoplastically deformable elastomer, and forcing said propellant into the envelope at elevated temperature.

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**4,389,265**

## BREAKDOWN OF SOLID PROPELLANTS AND EXPLOSIVES, RECOVERY OF NITRAMINES

**Albert S. Tompa, Indian Head, Md.; David M. French, Alexandria, Va., and Billy R. White, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 16, 1981, Ser. No. 283,709**
**Int. Cl.³ C06B *45/10***
**U.S. Cl. 149—109.6** **8 Claims**

1. A process for reclaiming a nitramine in high yield from a pyrotechnic material having a chemically crosslinked binder component selected from the group consisting of polyurethanes, polyamides, polyesters, and polyacrylates, which comprises the steps of:

(1) placing the pyrotechnic material into a solution consisting essentially of from about 2.0 N to about 6.0 N of an acid selected from the group consisting of HCl, $H_2SO_4$, and $H_3PO_4$ in an acetone-water solvent mixture, said solvent mixture consisting essentially of 40 to 60 volume percent acetone and water mixture;

(2) maintaining the mixture resulting from step (1) at a temperature of from about 15° C. to about 80° C. until the binder has been broken down; and

(3) isolating the nitramine.

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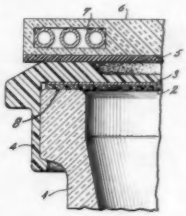
**4,389,266**

## PREPARATION OF GLASS CONTAINER FOR THERMOPLASTIC CLOSURE

**Michael T. Dembicki, and William J. Pond, both of Brockport, Pa., assignors to Brockway Glass Co., Inc., Brockway, Pa.**

**Continuation-in-part of Ser. No. 233,056, Feb. 10, 1981, Pat. No. 4,324,601, which is a continuation-in-part of Ser. No. 86,398, Sep. 19, 1979, Pat. No. 4,260,438. This application Jan. 15, 1982, Ser. No. 339,340**
**The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.**
**Int. Cl.³ B67B *3/00*; B32B *17/10*; C03C *15/00, 21/00***
**U.S. Cl. 156—69** **32 Claims**



20. A method for sealing an opening in a glass container having side walls comprising:

providing a rim-like sealing surface around said opening;

treating said sealing surface at a high temperature with a chemical agent comprising a metal oxide precursor selected from the group consisting of tin oxide and titanium oxide precursors and mixtures thereof which decomposes to form tin oxide, titanium oxide and mixtures thereof, respectively, at the container temperature, which renders said surface adherable to a thermoplastic membrane;

coating the exterior surface of said container including said side walls with a lubricity enhancing agent;

removing said lubricity enhancing agent from only said sealing surface by briefly exposing said surface to an intense heat source and heating it to below flame polishing temperature while avoiding destruction by heat of the effect of the lubricity enhancing treatment on the side walls,

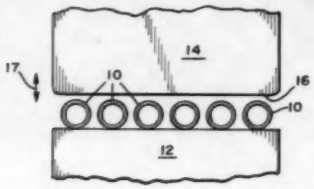
thereafter coating the finish surface with a chromium (III) organic metallic complex, and

pressing a membrane comprising a thermoplastic material against said sealing surface at a temperature above the softening point but below the melting point of said thermoplastic.

## 4,389,267
## METHOD OF FABRICATING A FLEXIBLE COVER BY ULTRASONIC VIBRATIONS

Clark A. Denslow, Wilton, Conn., assignor to Branson Ultrasonics Corporation, Newtown, Conn.

Filed May 24, 1982, Ser. No. 381,066
Int. Cl.³ B29C *27/08*
U.S. Cl. 156—73.2 6 Claims




1. The method of fabricating a flexible cover, such as a blind or shade, from tubular or rod thermoplastic members comprising:

providing a support;

disposing on said support a plurality of such members juxtaposed in spaced substantially parallel alignment with one another;

engaging the exposed side of said aligned members with an ultrasonically vibrating resonator at axially spaced locations of said members and exerting such engagement pressure between said resonator and members as to cause said members at such spaced locations to become flattened against said support and produce a relatively thin web of flowed thermoplastic material;

such web joining each set of two juxtaposed members and providing responsive to the cessation of ultrasonic vibrations and solidification of the flowed thermoplastic material a flexible joint between a pair of adjacent members.

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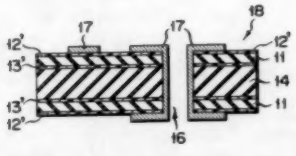
## 4,389,268
## PRODUCTION OF LAMINATE FOR RECEIVING CHEMICAL PLATING

Renzo Oshima, Hachioji; Yoshiyuki Kyojima, Kawasaki; Takara Fujii, and Shoji Kato, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Toshiba Chemical Products Company, Tokyo, both of, Japan

Filed Jul. 23, 1981, Ser. No. 285,981
Claims priority, application Japan, Aug. 6, 1980, 55-107945; Aug. 6, 1980, 55-107947
Int. Cl.³ C25D *5/34;* B32B *31/00;* B29C *17/08*
U.S. Cl. 156—150 24 Claims




1. A method of producing a laminate to the surface of which a chemical plating is to be applied, comprising the steps of:

(a) forming a thermosetting adhesive layer containing a butadiene-based rubber on at least one surface of a peel-resistant insulating sheet;

(b) curing the adhesive layer substantially completely;

(c) coarsening the surface of the cured adhesive layer;

(d) laminating the adhesive-bearing sheet on a base material such that the cured adhesive layer is bonded to the base material layer; and

(e) coarsening the outermost surface of the laminate on the side of the insulating sheet.

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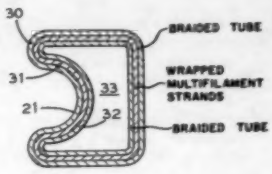
## 4,389,269
## SPORTS RACKET

Adrianus A. G. Cooper, and Phillip M. Leopold, both of Alliance, Ohio, assignors to Pepsico, Inc., Purchase, N.Y.

Division of Ser. No. 879,312, Feb. 21, 1978, Pat. No. 4,221,382.
This application Jul. 17, 1980, Ser. No. 169,839
Int. Cl.³ A63B *49/10*
U.S. Cl. 156—172 4 Claims




1. A method of manufacturing a composite sports racket frame of the type having a handle portion and an open-faced head portion with a plurality of stringholes to accommodate passage of stringing strung across the face of the head portion, which is resistant to and retards crack initiation and propagation in the area of the stringholes, comprising the steps of pulling an inner tubular layer of braided resin impregnated tow over a rod, spirally winding an intermediate layer of resin impregnated tow in the form of a multifilament strand over the outside perimeter of the inner braided tube in the head portion of the racket frame, pulling an outer tubular layer of braided resin impregnated tow over the intermediate spirally wound layer, removing the rod from within the inner tubular layer, inserting inflatable means within the inner tubular layer, placing the assembly consisting of the inner and outer tubular layers and the intermediate spirally wound layer in a mold, inflating the inflatable means so as to internally pressurize the assembly, and heat curing the assembly to the mold to form an integral plastic composite sports racket frame.

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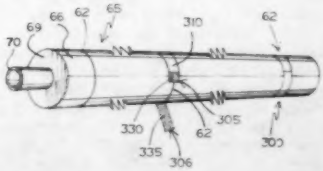
## 4,389,270
## METHOD FOR APPLICATION OF COMPOSITE PRESSURE SENSITIVE ADHESIVE

Jack M. McClintock, Stow, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Continuation-in-part of Ser. No. 38,679, May 14, 1979, Pat. No. 4,264,388, which is a continuation-in-part of Ser. No. 837,828, Sep. 29, 1977, Pat. No. 4,157,410. This application Dec. 19, 1980, Ser. No. 218,273
The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.
Int. Cl.³ B32B *31/00;* A61F *13/02;* E04F *13/20;* B32B *7/02*
U.S. Cl. 156—218 3 Claims




1. A method to seal contiguous items, comprising:

(a) peeling a second external release liner releasably attached to a second pressure sensitive adhesive layer on a side of a sealant strip having two termini;

(b) attaching said second pressure sensitive adhesive layer to a substantial portion of the intersection of the contiguous items;

(c) peeling a first external release liner extending only over a frictional portion of said sealant layer and located adjacent to one of said sealant layer termini and releasably attached to a first pressure sensitive adhesive layer on the opposite side of said sealant strip; and

(d) cohesively attaching the remaining portion of the second pressure sensitive adhesive layer to said fractional portion of said first pressure sensitive adhesive layer.

2. A composite pressure sensitive adhesive construction, comprising:

a butt sealant strip, said butt sealant strip comprising

(a) an exterior release liner having a contact side;

(b) a pressure sensitive adhesive layer;

(c) a sealant layer having two opposing sides and two termini;

(d) a second pressure sensitive adhesive layer; and

(e) a second exterior release liner having a contact side;

one side of said sealant layer attached to said first pressure sensitive adhesive layer and the remaining side of said sealant layer attached to said second pressure sensitive adhesive layer; said contact side of said first exterior release liner releasably attached to said first pressure sensitive adhesive layer and said contact side of said second exterior release liner releasably attached to said second pressure sensitive adhesive layer, said first pressure sensitive adhesive layer extending only over a fractional portion of said butt strip and located adjacent to one of said sealant layer termini.

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**4,389,271**

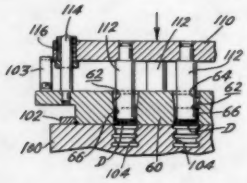
## METHOD FOR MAKING MOLDED ARTICLES

**Walter V. Shandy, Chester, and Jospeh M. Voytilla, Pottstown, both of Pa., assignors to The West Company, Phoenixville, Pa.**

**Continuation of Ser. No. 155,671, Jun. 5, 1980, abandoned, which is a continuation of Ser. No. 969,237, Dec. 13, 1978, abandoned, which is a continuation of Ser. No. 753,785, Dec. 23, 1976, abandoned. This application Mar. 2, 1982, Ser. No. 354,059**

**Int. Cl.³ B29C *7/00*; B29H *3/00*; B32B *25/00***

**U.S. Cl. 156—242** **2 Claims**




1. A method for making molded articles including a disc from a laminated sheet comprising a layer of elastomeric material and a layer of inert material consisting of the steps of partially cutting at least one disc from the sheet material, positioning the sheet over a transfer plate with the partially cut disc in registry with an opening in the transfer plate, positioning the transfer plate over a mold having at least one cavity therein with the openings of the transfer plate in registry with the cavities, completely severing the disc from the sheet material and transferring the severed disc through the opening in the transfer plate to the bottom of the mold cavity, charging the mold cavity with additional quantities of elastomeric material and curing the elastomeric materials.

**4,389,272**

## PROCESS AND FEEDING DEVICE TO PROVIDE CONSECUTIVE SERIES OF SMALL OBJECTS ON A SINGLE PLANE

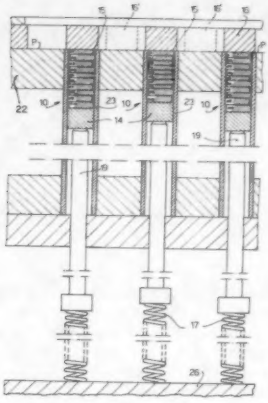
**Beniamino Ferri, Monza, and Giovanni Caimi, Saronno, both of Italy, assignors to Ferco S.p.A., Misinto, Italy**

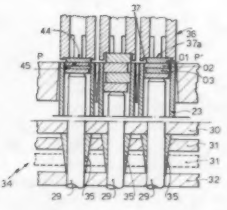
**Filed Jul. 21, 1981, Ser. No. 285,558**

**Claims priority, application Italy, Jul. 22, 1980, 23593 A/80**

**Int. Cl.³ B65G *59/02*; H05K *13/02***

**U.S. Cl. 156—297** **2 Claims**




1. A process for use with an apparatus having a plurality of magazines containing stacks of objects, the objects in a given stack having varying thicknesses, the magazines having open top ends and bottom ends closed by movable stoppers, said process comprising:

passing a pusher for each magazine through friction means comprising a conical bushing provided with a longitudinal slot, said friction means opposing movement of the pusher, an upper end of each pusher extending into a bottom end of a respective one of said magazines;

moving at least one of said conical bushings with respect to its associated pusher to thereby adjust the force exerted on said associated pusher by said friction means to thereby independently control the stroke of said associated pusher;

moving an operating plate so as to exert an upward force on the pushers whereby the pushers move the stoppers in an upward direction, the adjustment of the friction means controlling the amount of movement of the stoppers; and

positioning a stop device at the open top ends of the magazines to close the open top ends and to mechanically resist upward movement of the objects by upward movement of the stoppers so as to create a common plane for like surfaces of the objects.

## 4,389,273

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

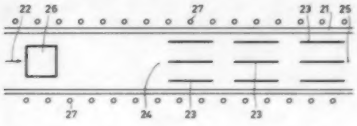
**Jan Bloem, and Cornelis H. J. van den Brekel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 97,022, Nov. 23, 1979, abandoned. This application Jul. 15, 1981, Ser. No. 283,397**

**Claims priority, application Netherlands, Dec. 21, 1978, 7812388**

**Int. Cl.³ C30B** *25/10*

**U.S. Cl. 156—605** **16 Claims**




1. A method of manufacturing a semiconductor device in which monocrystalline material is epitaxially grown on disc-shaped monocrystalline substrates in an elongate reactor from a gas flow in the longitudinal direction of the reactor, wich comprises:

establishing a temperature gradient in the gas flow within the reactor during the epitaxial growth in the direction of gas flow between a first upstream cross-section which is at a first temperature extreme and a second downstream cross-section which is at a second temperature extreme, both of said temperature extremes being above about 900° C.;

locating said substrates in the reactor between said upstream and downstream cross-sections so that the substrates are positioned between said first and second temperature extremes and the epitaxial growth process occurs at different temperatures;

providing the gas flow with the reaction components of the growth process in a composition which is in equilibrium with the material to be grown at said first temperature extreme upstream of the gas flow; and

selecting said second temperature extreme with respect to said first temperature extreme such that the gas flow becomes supersaturated with respect to the material to be grown upon traversing said temperature gradient between said first and second temperature extremes, so that said growth process is substantially determined by diffusion and yet said monocrystalline material is epitaxially grown on said substrate in a substantially homogeneous manner.

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## 4,389,274

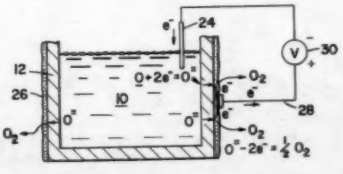
## ELECTROCHEMICAL DEOXYGENATION FOR LIQUID PHASE EPITAXIAL GROWTH

**David A. Stevenson, Los Altos Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 23, 1981, Ser. No. 246,529**

**Int. Cl.³ C30B** *19/00*

**U.S. Cl. 156—624** **11 Claims**




1. In a liquid phase epitaxial growth process of the type wherein a compound semiconductor material to be epitaxially deposited is dissolved in a solvent for said semiconductor material prior to the epitaxial growth of a semiconductor crystal, the improvement being a method for removing residual oxygen from a charge of said semiconductor material and said solvent, said improvement comprising the steps of:

(a) disposing said charge in a containment vessel of a solid-oxide electrolyte material under an inert protective atmosphere;

(b) heating said charge to at least the temperature where said compound semiconductor material is dissolved in said solvent and maintaining said temperature to form a liquid charge in said containment vessel;

(c) placing an electrode of an inert conducting solid in physical contact with said liquid charge; and

(d) applying an electric potential between said electrode and said containment vessel, the electrical contact to said containment vessel being made through a porous metallic coating on the outside surface of said containment vessel in the region where said liquid charge is contiguous to the outside surface of said containment vessel, said porous coating being relatively positive and said electrode being relatively negative, whereby said residual oxygen will be transported from the more negative potential to the more positive potential until a minimum value is obtained at the more negative electrode, the oxygen passing through the wall of the containment vessel and the porous coating.

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## 4,389,275

## QUARTZ RESONATOR ANGLE CORRECTION

**Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 25, 1982, Ser. No. 361,657**

**Int. Cl.³ B44C** *1/22;* **C03C** *15/00, 25/06*

**U.S. Cl. 156—626** **29 Claims**

1. The method of correcting the angle of cut of a quartz crystal resonator blank or plate which substantially eliminates the need for producing a mesa and subsequent machine lapping thereof to provide an inclined corrected angle surface on said blank, comprising the steps of:

(a) locating an uncorrected resonator blank in etching apparatus;

(b) generating an etching beam; and

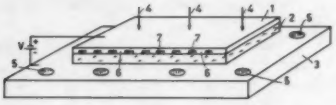
(c) scanning at least one major face of said resonator blank with said etching beam and effecting an etching gradient pattern of a predetermined type across the surface thereof wherein surface erosion occurs by an increasing amount thereacross which thereby changes said angle of cut of said resonator blank.

4,389,276

## METHOD OF MANUFACTURING AN ELECTRIC DISCHARGE DEVICE COMPRISING A GLASS SUBSTRATE HAVING A PATTERN OF ELECTRODES

Gerhard H. F. deVries, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,678
Claims priority, application Netherlands, Jun. 26, 1980, 8003696
Int. Cl.³ C23F 1/02
U.S. Cl. 156—630 10 Claims



1. A method of manufacturing an electric discharge device comprising the steps of
forming a metal foil with a relief pattern having a plurality of thick portions joined by thin portions,
placing said metal foil on a glass plate with said relief pattern in contact with said glass plate,
heating the assembly of metal foil and glass plate to a temperature $T_1$ lower than the melting point of the metal foil and wherein said glass plate has a viscosity of $10^7$ to $10^{13}$ Pa. sec.,
pressing said relief pattern of said metal foil into said glass plate until said thin portions at least bear on said glass plate,
bonding said metal foil to said glass plate by anodic bonding, and
removing at least said thin portions of said metal foil to form a pattern of electrodes of said thick portions in said glass plate.

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4,389,277

## METHOD OF MANUFACTURING AN ELECTRIC DISCHARGE DEVICE

Gerhard H. F. deVries, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,679
Claims priority, application Netherlands, Jun. 26, 1980, 8003697
Int. Cl.³ C23F 1/02
U.S. Cl. 156—630 9 Claims

1. A method of manufacturing an electric discharge device having an electrode pattern comprising the steps of
providing a metal foil on a glass substrate,
heating the assembly of said metal foil and glass substrate to a temperature $T_1$ lower than the melting point of said metal foil and where the viscosity of said glass substrate has a value in the range of $10^7$ to $10^{13}$ Pa.-sec.,
uniformly pressing said metal foil against said glass substrate for a predetermined time period sufficient to obtain uniform contact between said metal foil and said glass substrate,
bonding said metal foil to said glass substrate by an anodic bonding process, and
forming a predetermined pattern of electrodes by selective local removal of portions of said metal foil.

4,389,278

## METHOD FOR MANUFACTURING CIRCUIT BOARD WITH THROUGH HOLE

Kazuo Kai, 3-28-1, Kuwazu, Higashi Sumiyoshi-ku, Osaka, Japan

Filed Jul. 2, 1982, Ser. No. 394,620
Claims priority, application Japan, Jul. 25, 1981, 56/116566
Int. Cl.³ C25D 5/02; B05D 5/12; C23F 1/02; B44C 1/22
U.S. Cl. 156—630 5 Claims

1. A method for manufacturing a circuit board with through hole comprising the steps of:
forming a wiring pattern by selective etching on a two-side copper-clad laminated board;
providing a pierced hole to be used as through hole at a specified location;
masking the surface of said board except said pierced hole portion with conductive film and pH-resistant film;
forming a conductive plate film over the surface of said pierced hole portion by electroless plating;
forming a metal foil over said conductive plate film, through electroplating, by using said conductive film layer as an electrode at one end; and
removing said conductive film as well as pH-resistant film.

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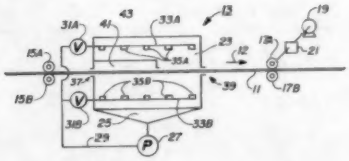
4,389,279

## METHOD OF ETCHING APERTURES INTO A CONTINUOUS MOVING METALLIC STRIP

Donald M. Weber, and Raymond A. Alleman, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,418
Int. Cl.³ C23F 1/02; B44F 1/22; C03C 15/00, 25/06
U.S. Cl. 156—640 10 Claims



1. In a method of etching a continuous etchable metallic strip from both major surfaces thereof to produce a multiplicity of apertures therethrough, said strip having a first acid-resistant stencil on one major surface thereof and a second acid-resistant stencil on the other major surface thereof, said first and second stencils having openings therein that are registered one with the other, said method including the steps of:
(a) moving said strip through an etching chamber,

(b) spraying liquid etchant in said chamber toward both of said major surfaces and

(c) shielding one of said major surfaces from exposure to said sprayed liquid etchant during the initial portion of said spraying step,

the improvement wherein said shielding is achieved by interposing a stationary wall opposite and spaced from said shielded surface and providing continuous side seals between said stationary wall and the edge portions of said moving strip, said strip and said wall defining a shielding chamber for said strip.

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**4,389,280**

## METHOD OF MANUFACTURING VERY THIN SEMICONDUCTOR CHIPS

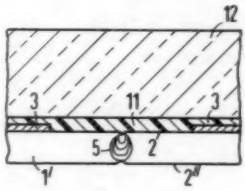
**Jan-Erik Müeller, Ottobrunn; Dietrich Ristow, Neubiberg, and Hermann Kniepkamp, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 27, 1981, Ser. No. 325,316**

**Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044947**

**Int. Cl.³ H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

**U.S. Cl. 156—645** **7 Claims**




1. In a process for producing components from a substrate body composed of a semiconductor material having at least one privileged cleavage direction whereby individual components are produced by separation from a larger substrate body, to which end said substrate body is superficially notched in a select pattern on a front surface of said body and thereafter provided with a protective covering on said front surface, and said body is subjected to an etching proceeding from a rear surface of said body in such a manner that the etchant penetrates into the semiconductor material of the substrate body in which there is inhomogeneity of semiconductor material impressed by the notching extending from the front surface of the substrate body, so that a separation into individual components then occurs, wherein the improvement comprises:

for the manufacture of semiconductor chips **(31)** having a thickness of only less than 50 μm as said components, said etching occurs surface-wide up to a prescribed thickness value of less than 50 μm; and

said protective covering on the front surface **(2)** of said substrate body **(1)** is selected and dimensioned as a carrier **(12)** for further support of the individual thin chips **(31)** which arise as a result of the separation **(30)**.

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**4,389,281**

## METHOD OF PLANARIZING SILICON DIOXIDE IN SEMICONDUCTOR DEVICES

**Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia; John S. Lechaton, both of Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 16, 1980, Ser. No. 217,077**

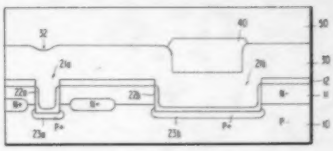
**Int. Cl.³ H01L** *21/306;* **C03C** *15/00*

**U.S. Cl. 156—646** **6 Claims**

1. A method for planarizing a non-level silicon dioxide layer which comprises at least one area (a) where a relatively high amount of silicon dioxide is to be removed and at least one area (b) where a relatively low amount of silicon dioxide is to be removed, said at least one area (a) and said at least one area (b) being non-level with respect to each other, said method comprising:

forming a first layer of a patterned HF permeable positive photoresist and a second layer of a negative HF permeable photoresist on said silicon dioxide, said combination of HF permeable photoresists providing a relatively rapid etch rate at said at least one area (a) and a relatively slow etch rate at said at least one area (b); and

exposing said layers of said HF permeable photoresists and




said silicon dioxide layer to HF gas at a pressure in the range of from about 2 to about 18 torr and at a temperature in the range of from about 150° C. to about 200° C., thereby etching and planarizing said silicon dioxide layer as said HF gas penetrates said HF permeable photoresists to relatively rapidly etch said at least one area (a) and relatively slowly etch said at least one area (b), said exposing to said HF gas and said etching continuing until said at least one area (b) and said at least one area (b) have both been etched so as to be substantially planar with respect to each other, wherein etching is completed prior to photoresist removal.

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**4,389,282**

## CERAMIC FIBER BOARD

**Celeste Yonushonis, Paoli, Pa., and Thomas E. Walters, Johnson City, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Aug. 6, 1982, Ser. No. 405,971**

**Int. Cl.³ D21H** *5/18*

**U.S. Cl. 162—145** **2 Claims**

1. A method of forming a uniformly flexible ceramic fiber board comprising the steps of:

a. forming a slurry of:

1. 74.5–96.8 weight percent of ceramic fibers,
2. 0.1–5 weight percent of a cationic acrylamide base copolymer,
3. 3–20 weight percent of an acrylic latex, and
4. 1–15 weight percent of aluminum sulfate; whereby said acrylic latex is deposited homogeneously on said fibers.

b. vacuum forming a shape of said latex coated fibers from said slurry, and

c. drying said shape dielectrically to form said board.

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**4,389,283**

## METHOD FOR MAKING COKE VIA INDUCTION HEATING

**Albert Calderon, 1065 Melrose Dr., Bowling Green, Ohio 43402**

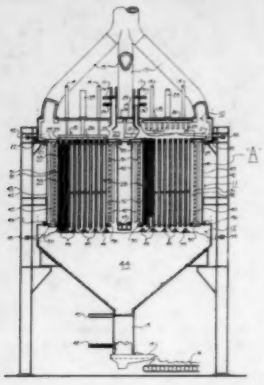
**Continuation-in-part of Ser. No. 201,699, Oct. 29, 1980, abandoned. This application Jan. 29, 1981, Ser. No. 229,317**

**Int. Cl.³ C10B** *51/00, 57/00, 57/18*

**U.S. Cl. 201—19** **35 Claims**

1. A method of making coke comprising the steps of charging coal into a plurality of compartments whose walls comprise a material which is adaptable to being heated by induction and wherein said plurality of compartments commonly share an induction coil means which surrounds said plurality of compartments and said induction coil means does not individually surround any of said compartments, heating said walls of

said plurality of compartments by said induction coil means to cause the devolatilization of the coal contained within each



compartment of said plurality of compartments to convert said coal to coke, and discharging said coke from said plurality of compartments.

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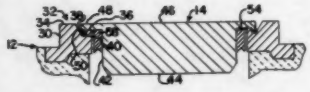
**4,389,284**

## CHARGING HOLE COVER SEAL

George R. Cain, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1981, Ser. No. 334,966
Int. Cl.³ C10B *25/20, 25/24*
U.S. Cl. 202—247 7 Claims



1. A structure for sealing a charging hole on a coke oven battery top comprising:

(a) an annulus-shaped frame section projecting upwardly from the battery top and peripherally surrounding the charging hole and having a generally vertical inner side adjacent the charging hole, and a generally vertical outer side remote from the charging hole and a generally horizontal top end, said top end being positioned between said inner and outer sides and, itself, having integral, concentric inner and outer planar surfaces between which there is interposed a concentric circular groove containing a particulate material;

(b) a disc-shaped cover section superimposed over said charging hole and having a lower end surface disposed toward the charging hole, a peripheral lateral surface inwardly spaced from and concentrically arranged with respect to the inner side of the frame section, and an upper end surface having a lateral lip extension vertically abutting the inner planar surface of the frame section top end, said lip extension having a terminal, peripheral and downwardly projecting tongue engaging said groove of the frame section top end, such that a primary, inward continuous gas seal is formed between said lip extension and said inner planar surface of the frame section top end, and a secondary, outward continuous gas seal is formed between said tongue and said groove;

(c) at least two lugs projecting radially outwardly from the lateral surface of the cover section; and

(d) at least two ledges projecting radially inwardly from the inner side of the frame section such that the cover section may be elevated so as to allow fluid communication between the charging hole and ambient air by superimposing each of said lugs on one of said ledges.

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**4,389,285**

## PROCESS INHIBITOR FOR READILY POLYMERIZABLE ETHYLENICALLY UNSATURATED AROMATIC COMPOUNDS

Ted L. Douglas; Ambrose J. Clonce, Jr., and Glenn C. Jones, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,489
Int. Cl.³ C07C *7/20*; B01D *3/34*
U.S. Cl. 203—9 7 Claims

1. In processes for the preparation of readily polymerizable ethylenically unsaturated aromatic compounds, the improvement which comprises employing 3,5-dinitrosalicylic acid as a process inhibitor.

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**4,389,286**

## ALKALINE PLATING BATHS AND ELECTROPLATING PROCESS

Ewald H. McCoy, Brookfield, Wis., assignor to Electrochemical Products, Inc., New Berlin, Wis.

Continuation-in-part of Ser. No. 169,752, Jul. 17, 1980, Pat. No. 4,356,067, and a continuation-in-part of Ser. No. 48,265, Jun. 13, 1979, abandoned. This application Sep. 28, 1982, Ser. No. 426,067
Int. Cl.³ C25D *3/32, 3/36, 3/58*
U.S. Cl. 204—44 8 Claims

1. A cyanide-free plating bath for the electrodeposition of copper containing alloys consists of an aqueous solution containing copper ions and ions selected from tin and lead ions, a chelating agent selected from glucoheptonic acid and salts thereof, and sufficient caustic to have a pH of about 10 to about 13.5.

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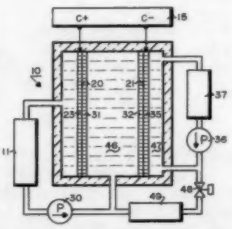
**4,389,287**

## WITHDRAWAL OF MOLTEN ALKALI HYDROXIDE THROUGH AN ELECTRODE FOR DEPLETION OF WATER DISSOLVED THEREIN

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 117,240, Jan. 31, 1980, Pat. No. 4,276,145, and a continuation-in-part of Ser. No. 221,552, Dec. 31, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,614
Int. Cl.³ C25B *15/08*; C25C *3/02*
U.S. Cl. 204—68 6 Claims



1. A process for depleting water which forms in molten alkali hydroxide during electrolysis thereof, comprising the steps of:

operating an electrolysis cell by applying a voltage to electrodes therein whereby hydroxide ions are reduced on an anode and form the water which is incorporated into

molten alkali hydroxide anolyte in an anolyte portion of the electrolysis cell,

withdrawing the anolyte with the water incorporated therein through withdrawal openings in the anode thereby removing said anolyte from operating portions of the electrolysis cell,

depleting the incorporated water from said removed anolyte in a means for dehydrating the anolyte which is separate from the operating portions of the cell to produce a dehydrated anolyte, and

returning the dehydrated anolyte to the anolyte portion of the electrolysis cell for further electrolysis.

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**4,389,288**

## CATALYZED ELECTROCHEMICAL GASIFICATION OF CARBONACEOUS MATERIALS AT ANODE AND PRODUCTION OF HYDROGEN AT CATHODE

**Ronald J. Vaughan, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Sep. 28, 1981, Ser. No. 305,876**

**Int. Cl.³ C25B *1/00, 1/04***

**U.S. Cl. 204—101** **9 Claims**

**1.** In the method of electrochemical gasification of carbonaceous materials in an aqueous acidic electrolyte by anodic oxidation to produce oxides of carbon at the anode and hydrogen at the cathode of an electrolysis cell, the improvement which comprises:

adding an amount of iron in its elemental, +2 or +3 valence state or mixtures thereof to the electrolyte containing the carbonaceous material sufficient to increase the rate of oxidation of the carbonaceous material at the anode.

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**4,389,289**

## BIPOLAR ELECTROLYZER

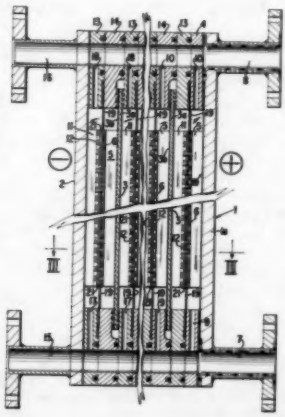
**Oronzio deNora, Milan, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy**

**Filed Jan. 14, 1981, Ser. No. 224,906**

**Claims priority, application Italy, Jan. 16, 1980, 19225 A/80**

**Int. Cl.³ C25B *1/26, 1/46, 11/00, 9/04***

**U.S. Cl. 204—128** **14 Claims**



**1.** A bipolar electrolysis cell of the diaphragm type comprising a frame made of an electrically inert material provided with means to introduce and remove anolyte and catholyte, and anodic endplate, a cathodic endplate and at least one polar element comprised of abutting cathodic plate and anodic plate having secured thereto the cathode structure and the anode structure respectively, the said plates of the bipolar element being held in electrical contact with each other by means of pressure applied by a resilient mat coextensive with the cell area which is compressed upon assembly of the electrolyzer.

**7.** A method of electrolyzing an aqueous alkali metal halide solution comprising feeding an aqueous alkali metal halide solution to an electrolyzer of claim **1** while impressing an electrolysis current thereon and recovering the halogen.

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**4,389,290**

## USE OF ELECTROCATALYTIC ANODES IN PHOTOLYSIS

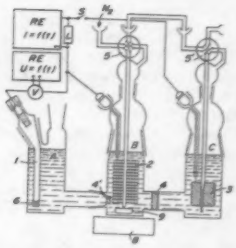
**Michael Gratzel, Vaud, and Michael Neumann-Spallart, Lausanne, both of Switzerland, assignors to Engelhard Corporation, Iselin, N.J.**

**Filed Jul. 2, 1981, Ser. No. 279,908**

**Claims priority, application United Kingdom, Jul. 8, 1980, 8022342**

**Int. Cl.³ C25B *1/04, 1/26, 11/08, 11/10***

**U.S. Cl. 204—128** **32 Claims**



**1.** A photolytic sysem for the production of oxidation and reduction products which comprises: (1) a darkenable halfcell containing an anode and an oxidizable substrate; (2) an illuminatable halfcell containing a composition which under the action of visible light exhibits an enhanced ability to donate electrons, a cathode, an electron relay which accepts electrons, a catalyst for mediating an oxidation-reduction process and an oxidizable or reducible substrate; and (3) means for transporting electrons and ions between said illuminatable halfcell and darkenable halfcell; wherein the anode is an anodic catalyst and is selected from the group consising of: (a) ruthenium oxide, (b) iridium oxide, (c) ruthenate salts, (d) indate salts, and mixtures of two or more thereof.

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**4,389,291**

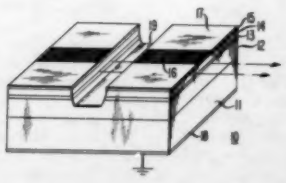
## PHOTOELECTROCHEMICAL PROCESSING OF INP-TYPE DEVICES

**Paul A. Kohl; Frederick W. Ostermayer, Jr., and Catherine Wolowodiuk, all of Chatham, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jun. 19, 1981, Ser. No. 275,245**

**Int. Cl.³ C25F *3/12***

**U.S. Cl. 204—129.3** **16 Claims**



**1.** A process for fabricating devices comprising at least one

n-type III-V compound semiconductor in which the Group III part of the compound semiconductor comprises at least 50 weight percent indium and the process comprises at least one step in which the n-type semiconductor compound is photoelectrochemically etched by an oxidation-reduction reaction in an electrolytic solution characterized in that

a. the oxidation is carried out by irradiating the n-type III-V compound semiconductor with radiation comprising photon energy at least as great as the bandgap of the compound semiconductor so as to produce holes that permit oxidation of the compound semiconductor,

b. the electrolytic solution comprises oxidizing agent with reduction potential in the electrolytic solution between the potential of the conduction band minimum and the potential of the valence band maximum so that the elements in the n-type III-V compound semiconductor are all oxidized to form oxidation products that are soluble in the electrolytic solution, and

c. the oxidizing agent is reduced on a metallic or p-type surface electrically connected to the III-V compound semiconductor.

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**4,389,292**

## ZIRCONIUM ISOTOPE SEPARATION

**D. Colin Phillips, Monroeville, and Steven H. Peterson, Murrysville Boro., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 4, 1981, Ser. No. 270,457**
**Int. Cl.³ B01D *59/00***
**U.S. Cl. 204—158 R** **11 Claims**

3. A method of separating zirconium into a portion having a higher concentration of the $^{91}Zr$ isotope and portion having a lower concentration of the $^{91}Zr$ isotope comprising:

(A) preparing a composition which comprises:

(1) a zirconium chelate ligand;

(2) a solvent for said zirconium chelate ligand; and

(3) a scavenger which reacts with an excited state of said zirconium chelate ligand but not with its ground state;

(B) exciting said zirconium chelate ligand to said excited state;

(C) permitting about 25 to about 75% of said zirconium chelate ligand to react with said scavenger; and

(D) separating said zirconium chelate ligand from the reaction product of said zirconium chelate ligand with said scavenger.

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**4,389,293**

## PROCESS FOR THE RECOVERY OF ANHYDROUS HYDROGEN FLUORIDE FROM AQUEOUS SOLUTIONS OF FLUOSILICIC ACID AND HYDROGEN FLUORIDE

**Krishnamurthy N. Mani, Denville, and Frederick P. Chlanda, Rockaway, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Jan. 4, 1982, Ser. No. 336,734**
**Int. Cl.³ B01D *57/02***
**U.S. Cl. 204—180 P** **15 Claims**

1. A process for recovering anhydrous hydrogen fluoride from a dilute solution comprising hydrogen fluoride, fluosilicic acid and water, wherein the percentage composition of said solution is such that anhydrous hydrogen fluoride cannot be recovered therefrom by distillation, said process comprising the steps of:

(a) introducing said dilute solution into a dilute compartment of at least one unit cell of an electrodialysis assembly comprising one or more unit cells positioned between an anolyte compartment containing an anode immersed in an anolyte, and a catholyte compartment containing a cathode immersed in a catholyte, each of said unit cells comprising a concentrate compartment and a dilute compartment separated by an anion permeable membrane, and each bounded by a face of a cation permeable membrane;

(b) introducing into said concentrate compartment an aqueous solution of hydrogen fluoride and fluosilicic acid wherein the concentration of fluosilicic acid in said solution is greater than about 5 weight percent, and wherein the total acids concentration in said solution is such that hydrogen fluoride cannot be obtained therefrom by distillation;

(c) passing direct current through said electrodialysis assembly for a time sufficient to increase the concentration of hydrogen fluoride in said concentrate compartment forming a product solution in which the total acids concentration is such that anhydrous hydrogen fluoride can be recovered therefrom by distillation;

(d) withdrawing said product solution from said concentrate compartment; and

(e) recovering anhydrous hydrogen fluoride from said solution of step (d) by distillation.

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**4,389,294**

## METHOD FOR AVOIDING RESIDUE ON A VERTICAL WALLED MESA

**Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, both of N.Y.; John L. Mauer, IV, South Kent, Conn., and Homi G. Sarkary, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 30, 1981, Ser. No. 279,129**
**Int. Cl.³ C23C *15/00***
**U.S. Cl. 204—192 E** **7 Claims**

1. A method for avoiding residue on a vertical walled dielectric mesa of a layer to be deposited on said mesa and to be removed by reactive ion etching comprising the steps of

providing a silicon substrate having said dielectric mesa on a surface thereof, and reshaping a wall of said dielectric mesa so as to be sloping at an angle equal to or greater than 30° relative to a line vertical to said surface of said substrate.

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**4,389,295**

## THIN FILM PHOSPHOR SPUTTERING PROCESS

**Ernest Davey, Peabody; Lawrence L. Hope, Stow, and Charles E. Deschenes, Marblehead, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed May 6, 1982, Ser. No. 375,626**
**Int. Cl.³ C23C *15/00***
**U.S. Cl. 204—192 P** **24 Claims**

1. A process for forming a thin film phosphor layer comprised of a heat substance doped with an activator, said phosphor layer being formed on a substrate in the making of an electroluminescent display device, comprising the steps of:

providing a phosphor chamber having targets of respective host substance and activator, applying heat to said substrate to elevate the temperature thereof while maintaining a vacuum in the chamber, supporting and rotating or translating the substrate in the chamber, initiating sputtering within the chamber by causing a sputtering gas to flow therein while concurrently exciting said targets to form a plasma in said chamber, and maintaining the sputtering for a period of time.

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**4,389,296**

## EDGE CONTACTING PLATING ELECTRODE

**Michael Seyffert, Santa Cruz, and Steven W. Taatjes, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Mar. 22, 1982, Ser. No. 360,743**
**Int. Cl.³ C25D *17/00***
**U.S. Cl. 204—206** **7 Claims**

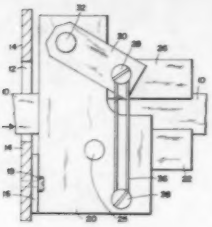
1. In apparatus to electroplate material onto a movable web of conductive material, an electrode adapted to provide electrical contact with the web comprising in combination:

support bracket means adapted to be mountable proximate the path of said movable web;

a first contact mounted on said support bracket means, hav-

ing a groove operable to accept one edge of the web for sliding contact therein;

a second contact pivotally mounted on said support bracket means, having a groove operable to accept the other edge of the web for sliding contact therein, said grooves being generally straight and extending along the edge of the web for a length sufficient to provide smooth sliding contact



with said web and generous contact area, and having V-shaped sides that slant towards each other, as said sides extend deeper into the grooves, so as to center the web in the groove under the action of said urging means and enhance contact with the corners of the web; and

means urging said first and second contacts toward each other and into sliding contact with the edges of said web.

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4,389,297

## PERMIONIC MEMBRANE ELECTROLYTIC CELL

**Malcolm Korach, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 195,570, Oct. 9, 1980, Pat. No. 4,299,675. This application May 13, 1981, Ser. No. 263,329**

**Int. Cl.³ C25B** *9/00, 11/04, 13/08*

**U.S. Cl. 204—252** **26 Claims**

1. In an electrolytic cell having an anode, a cathode, and a cation selective permionic membrane therebetween, the improvement wherein said cathode removably bears upon the permionic membrane and comprises an electroconductive substrate, electrocatalyst bonded to the substrate and facing the permionic membrane, and a layer of hydrophilic resin bonded to the electrocatalyst (and) said layer of hydrophilic resin interposed between the permionic membrane and the electrocatalyst and removably bearing upon the permionic membrane.

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4,389,298

## NOVEL BIPOLAR ELECTRODE ELEMENT

**Alberto Pellegri, Luino, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy**

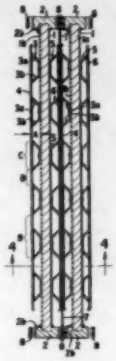
**Continuation-in-part of Ser. No. 128,972, Mar. 10, 1980, Pat. No. 4,279,731. This application May 26, 1981, Ser. No. 266,653**

**Claims priority, application Italy, Nov. 29, 1979, 27690 A/79**

**Int. Cl.³ C25B** *11/02, 11/10*

**U.S. Cl. 204—288** **2 Claims**

1. A bipolar element for bipolar diaphragm electrolyzers equipped with vertical electrodes comprising a vertical steel plate on the cathode side clad with a valve metal on the anode side, a rectangular frame around the perimeter of said plate, baffles made of valve metal on the anode side and steel on the cathode side distributed along the entire width of both surfaces of the bipolar element, a valve metal screen anode structure positioned on the edges of said valve metal baffles and provided with a non-passivatable coating, a cathode screen structure of a cathodically resistant metal positioned on the edges of said steel baffles, the said baffles being alternately inclined one way and the opposite way with respect to a vertical plane normal to the bipolar plate thereby forming a series of vertical flow channels extending for a substantial portion of the height of the bipolar plate, the ratio between the electrode surface intercepted by the edges of two adjacent baffles and the flow section of the channel thereby defined being different from the same ratio corresponding to the adjacent flow channel in the



series, the said valve metal baffles being positioned over a groove in the steel plate in which resides a bimetal strip with a valve metal side and a side of highly conductive metal resistant to hydrogen migration.

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4,389,299

## SPUTTERING DEVICE

**Ryuichi Adachi, Toyonaka; Isao Yamada, Uji, and Kazuhiro Takeshita, Osaka, all of Japan, assignors to Osaka Vacuum Chemical Co., Ltd., Osaka, Japan**

**Filed Jun. 22, 1981, Ser. No. 275,784**

**Claims priority, application Japan, Jun. 23, 1980, 55-85398**

**Int. Cl.³ C23C** *15/00*

**U.S. Cl. 204—298** **2 Claims**

1. A sputtering device comprising:

a target electrode having a target and a flat magnet disposed under said target said magnet comprised of an annular magnetic pole having one polarity and a magnetic pole having the other polarity located inside said annular magnetic pole;

a substrate disposed oppositely to said target;

an electric field ring electrode disposed between said substrate and said target for generating an electric field between said target electrode and said electric field ring electrode, said electric field being incident on said magnet in a direction substantially perpendicular thereto;

an electron beam emitting filament disposed adjacent said target; and

an anode electrode for guiding an electron beam from said filament between said target and said electric field ring electrode.

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4,389,300

## SOLVENT EXTRACTION METHOD

**David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Sep. 26, 1979, Ser. No. 79,300**

**Int. Cl.³ C10G** *1/04*

**U.S. Cl. 208—11 LE** **8 Claims**

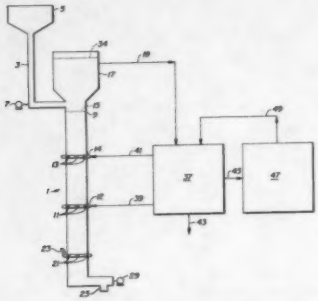
1. A method for extracting an extractable component from a mixture including said extractable component and subdivided solids, comprising:

(a) maintaining a vertically extending packed bed comprising said solids in a vertically extending extraction zone and introducing said mixture into an upper portion of said bed;

(b) providing a substantially continuous gaseous phase in contact with a lower portion of said bed;

(c) maintaining a substantially continuous liquid phase comprising a vaporizable primary liquid solvent and at least one secondary liquid solvent in contact with at least a lower part of said upper portion of said bed above said gaseous phase, said liquid phase and said gaseous phase having an interface at a vertically intermediate level of said bed;

(d) introducing said primary liquid solvent into an intermediate liquid level in said liquid phase spaced from the top of said liquid phase;



(e) introducing at least one secondary liquid solvent into said liquid phase above said intermediate liquid level;

(f) extracting said extractable component from said mixture into said liquid phase, and removing said extractable component and said solvents from said extraction zone;

(g) preventing said liquid phase from flowing downwardly through said lower portion of said bed by maintaining said gaseous phase at a pressure sufficient to support said liquid phase thereon and vaporizing said primary solvent adhering to solids in said lower portion of said bed; and

(h) removing solids from said lower portion of said bed.

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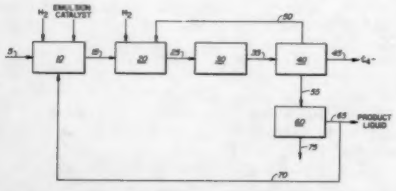
**4,389,301**

## TWO-STEP HYDROPROCESSING OF HEAVY HYDROCARBONACEOUS OILS

**Arthur J. Dahlberg, Rodeo; John H. Shinn, Richmond; Joel W. Rosenthal, El Cerrito, and Tim T. Chu, Oakland, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Oct. 22, 1981, Ser. No. 314,141**
**Int. Cl.³ C10G 47/06, 49/12**
**U.S. Cl. 208—59** **16 Claims**




1. A process for hydroprocessing a heavy hydrocarbonaceous oil feed to convert at least a portion of feed components boiling above 350° C. to components boiling below 350° C. comprising:

(a) contacting said oil with added hydrogen in a first reaction zone under hydroprocessing conditions, including a hydrogen partial pressure of above 35 atmospheres in the presence of (1) added dispersed hydrogenation catalyst suspended in said oil and containing at least one catalytic hydrogenation component selected from transition metal elements or compounds thereof, and (2) added porous contact particles to produce a first effluent having a normally liquid portion; and

(b) contacting at least a portion of the normally liquid portion of said first effluent in a second reaction zone with hydrogen under hydrogenation conditions in the presence of a bed of particulate hydrogenation catalyst, to produce a second effluent.

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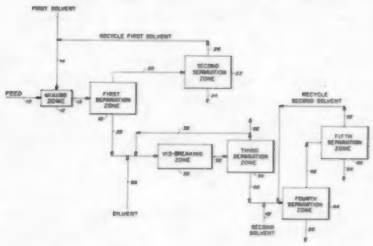
**4,389,302**

## PROCESS FOR VIS-BREAKING ASPHALTENES

**Leo Garwin, Oklahoma City, and Roger A. Baldwin, Warr Acres, both of Okla., assignors to Kerr-McGee Refining Corporation, Oklahoma City, Okla.**

**Filed May 15, 1981, Ser. No. 263,977**
**Int. Cl.³ C10G 55/04, 9/14**
**U.S. Cl. 208—86** **25 Claims**




1. A process comprising:

introducing a heavy hydrocarbon material comprising oils, resins, asphaltenes and associated organometallic compounds and a first solvent into a first separation zone maintained at an elevated temperature and pressure level to effect a separation of said heavy hydrocarbon material and first solvent into a first light phase including first solvent and a first heavy phase comprising asphaltenes, organometallic compounds and some first solvent;

recovering first solvent from said first light phase in a second separation zone;

introducing said first heavy phase into a vis-breaking zone maintained at an elevated temperature and pressure level to crack said asphaltenes in said first heavy phase to produce distillable and substantially nondistillable liquid vis-broken products including organometallic compounds, said pressure level being such that substantially a single condensed phase exists within said vis-breaking zone;

introducing said distillable and substantially non-distillable liquid products from said vis-breaking zone into a third separation zone to separate at least a portion of said distillable liquid products from the remainder;

introducing said remainder from said third separation zone and a second solvent into a fourth separation zone maintained at an elevated temperature and pressure to effect a separation of said mixture into a fourth light phase comprising nondistillable liquid products substantially free of organometallic compounds, any distillable liquid products present and second solvent and a fourth heavy phase comprising a residue including organometallic compounds and some second solvent; and

4,389,303

## PROCESS OF CONVERTING HIGH-BOILING CRUDE OILS TO EQUIVALENT PETROLEUM PRODUCTS

Thomas Simo, Bad Homburg, and Karl-Heinz Eisenlohr, Dreieich, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,393

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949935

Int. Cl.³ C10G *45/58, 47/34, 49/22*

U.S. Cl. 208—107 11 Claims

1. A process of converting a high-boiling crude oil having a high content of nondistillable residues, said crude oil containing metals and at least 5 percent of asphaltenes, to equivalent petroleum products which comprises, in a single hydrovisbreaking stage free of catalyst, hydrovisbreaking said high boiling crude oil in the presence of molecular hydrogen and in admixture with a hydrogen donor solvent at a total pressure of 40 to 200 bars, 10 to 50 percent by weight of said mixture being said hydrogen donor solvent, said mixture being at a temperature in the range of 400° to 450° C. and being 4° to 5° C. below the carbonization temperature limit, the hydrovisbreaking conditions comprising a liquid hourly space velocity of 0.5 to 2 and a gas circulation ratio of 400 to 2000 standard cubic meters per metric ton of the entire liquid feed to said hydrovisbreaking stage, withdrawing from said hydrovisbreaking stage a liquid effluent and subjecting said effluent to a distillation, withdrawing from said distillation a residue fraction and at least one distillate fraction, said hydrogen donor solvent being one boiling in the range of 200°–530° C. and being selected from the group consisting of:

(a) a fraction from said crude oil if the crude oil contains more than 20% of naphthenic constituents; or

(b) a distillate fraction from said distillation, said fraction having a naphthene concentration exceeding 20%.

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4,389,304

## CATALYTIC HYDRODESULFURIZATION OR HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING ALUMINA PROMOTED WITH ZINC, TITANIUM, COBALT AND MOLYBDENUM AS THE CATALYTIC AGENT

Alan D. Eastman, and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,437, Feb. 28, 1980, Pat. No. 4,287,050. This application Apr. 28, 1981, Ser. No. 258,237

Int. Cl.³ C10G *23/02*

U.S. Cl. 208—254 H 18 Claims

1. A process for the catalytic hydrodenitrogenation of an organic nitrogen compound comprising the step of contacting said organic nitrogen compound under suitable hydrodenitrogenation conditions with a catalyst composition comprising catalytic grade alumina, zinc titanate, cobalt, and molybdenum.

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4,389,305

## CATALYTIC HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE

Lloyd E. Gardner; Floyd E. Farha, Jr.; Alan D. Eastman, and Lewis E. Drehman, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,429, Feb. 18, 1980, abandoned. This application Apr. 30, 1981, Ser. No. 258,975

Int. Cl.³ C10G *45/04*

U.S. Cl. 208—254 H 25 Claims

1. A process for the catalytic hydrodenitrogenation of an organic nitrogen compound comprising the step of contacting said organic nitrogen compound under suitable hydrodenitrogenation conditions with a catalyst composition comprising zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof, wherein the concentration by weight of said promoter in said catalyst composition is less than the total concentration by weight of said zinc and said titanium in said catalyst composition and wherein said zinc and titanium are present in said catalyst composition in the form of zinc titanate prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of molecular oxygen at a temperature in the range of about 650° C. to about 1050° C.

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4,389,306

## PROCESS FOR REMOVING ASH FROM COAL

Takeshi Nakanishi; Kazuo Harada; Nobuyuki Yoshida, and Etsuo Ogino, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Sep. 24, 1981, Ser. No. 305,157

Claims priority, application Japan, Oct. 8, 1980, 55-141504; Oct. 8, 1980, 55-141505; Oct. 8, 1980, 55-141506

Int. Cl.³ B03B *1/00*

U.S. Cl. 209—5 8 Claims

1. A process for removing ash from coal comprising the steps of pulverizing the coal to fine particles, up to hundreds of micro-meters in size, admixing water with the finely divided coal to obtain an ash-containing slurry of finely divided coal, mixing with the slurry an oil and seeds about 1–10 mm in size in the form of oleophilic solid grains and serving as granulating nuclei to granulate the finely divided coal, separating the resulting granules from the mixture and washing the same with water to remove the ash, disintegrating the washed granules and separating the granules into seeds and an oil-containing deashed coal in the form of pellets to obtain the oil-containing deashed coal and recover the seeds, and reusing the seeds for the granulating step.

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4,389,307

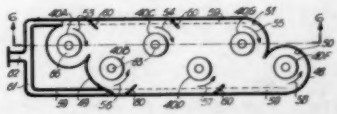
## ARRANGEMENT OF MULTIPLE FLUID CYCLONES

John D. Boadway, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed Jun. 22, 1981, Ser. No. 275,987

Int. Cl.³ B04C *5/28*; 55 *346/349/459 R/461*

U.S. Cl. 209—211 17 Claims



1. A header for a plurality of cyclones, said header having a first chamber with an inlet thereto and a plurality of outlets therefrom, said outlets being spaced apart from one another downstream from said inlet providing inlets to respective ones of a plurality of cyclones; and deflector means in said passageway to create a stable pattern of multiple vortices of flowing fluid in said chamber, said vortices being in contact with each other and consisting of a series of counter-rotating pairs lo-

cated such that there is a vortex at each of said plurality of outlets.

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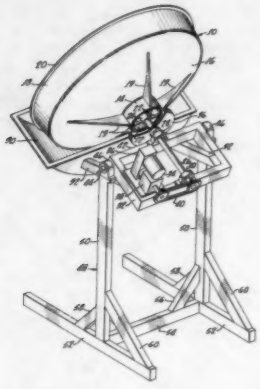
**4,389,308**
**APPARATUS FOR SEPARATING ORES**
**Keith B. Cleland, 4460 Park Newport, Newport Beach, Calif. 92660**
**Filed Nov. 19, 1981, Ser. No. 322,906**
**Int. Cl.³ B03B** *5/58*
**U.S. Cl. 209—444** **12 Claims**



1. Ore separation apparatus comprising
a rotatable container having a concave portion with an opening for discharging concentrated ore at its center,
an elongated cylindrical hub, one end of which abuts said container and circumscribes said opening to pass said concentrated ore, the hub mounting the container,
drive means including an elongated drive shaft substantially smaller in cross section than said opening,
said drive shaft having one end portion centered within said hub and extending outwardly therefrom away from the container,
and spider means connecting the shaft to the interior of said hub, whereby the hub is mounted to the shaft so that the entire weight of the container is transmitted via the hub to the shaft end portion,
said concave portion of said container facing away from said hub,
and said shaft being axially aligned therewith.

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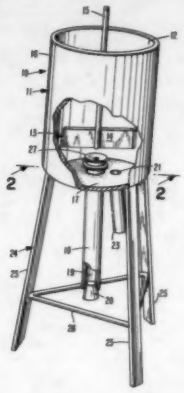
**4,389,309**
**HEAVY METALS SEPARATOR**
**Laurence H. Konvalin, 7722 Vineyard Rd., Sacramento, Calif. 95823**
**Filed Nov. 2, 1981, Ser. No. 317,536**
**Int. Cl.³ B03B** *5/02*
**U.S. Cl. 209—465** **1 Claim**

1. A heavy metals separator, comprising, in combination, an upright, cylindrical tank containing a rotatable impeller about a vertical shaft for producing a centripetal action force on placer ore placed into said tank, and means to collect heavy metal particles from said ore while a remainder of said ore is flushed out from said tank; said means comprising a sand and gravel collector pipe under the center of said impeller and extending downward through a bottom wall of said tank, an upper end of said sand and gravel collector pipe extending upwardly of said bottom wall and being fitted with a restrictor, while a downward tube also through said bottom wall collects said heavy metal particles, an upper end of said tube being



flush with said bottom wall, and a removable mesh placed upon said bottom wall.

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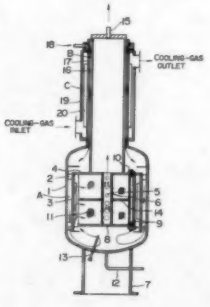
**4,389,310**
**COLD TRAP**
**Katsumi Seki, Hitachi; Yasuo Tachi, Tokyo, and Yoji Shibata, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Dec. 22, 1978, Ser. No. 972,212**
**Claims priority, application Japan, Dec. 26, 1977, 52-155588**
**Int. Cl.³ B01D** *35/06*
**U.S. Cl. 210—183** **9 Claims**




1. A cold trap disposed in a sodium circulating system and adapted for purifying the circulated sodium comprising:
a sodium-cooling zone in which said sodium is cooled through a heat exchange with a cooling fluid of a low temperature;
an impurity-trapping zone, for receiving cooled sodium from said sodium-cooling zone, adapted to trap the impurities precipitated in the cooled sodium;
said impurity-trapping zone being disposed at a position where no heat exchange with said sodium-cooling zone occurs, so that the sodium is cooled in the sodium-cooling zone substantially to the temperature at which it passes through the impurity-trapping zone, whereby the temperature of the sodium in the impurity-trapping zone is substantially constant;
an economizer zone adjacent to said sodium-cooling zone and adapted to reheat the sodium coming from the impuri-

ty-trapping zone through a heat exchange with the sodium flowing in said sodium-cooling zone; and

a vessel in which said zones are defined,

whereby heat exchange between said impurity-trapping zone and the sodium-cooling and economizer zones is avoided due to positioning of the three zones.

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**4,389,311**

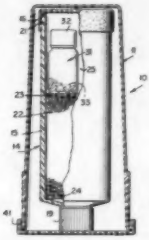
**PORTABLE WATER PURIFIER**

**Henry La Freniere, 8421 Forest Hills Dr., Coral Springs, Fla. 33065**

**Continuation of Ser. No. 146,310, May 5, 1980, abandoned. This application Jul. 16, 1981, Ser. No. 283,992**

**Int. Cl.³ C02F *1/28, 1/50***

**U.S. Cl. 210—198.1** **11 Claims**



1. A packaged kit for use in the purification of water, comprising:

a kit package comprising a container for retaining water and a removable cover closing said container; a water filter in said kit package which is removable therefrom, said water filter comprising a flow through casing having an inlet end and an opposite outlet end to provide for axial flow through the casing, said casing including a bed of particulate adsorbent for adsorbing impurities from the water and first and second permeable supporting members within the casing supporting and confining said bed of particulate adsorbent therebetween over the casing crosssection, said casing including a water reservoir space between the inlet end and supported bed of particulate adsorbent; and a disinfectant package in said kit package which is removable therefrom, said disinfectant package including a disinfectant for water borne bacteria and viruses.

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**4,389,312**

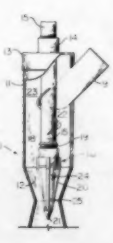
**VARIABLE VENTURI SEWERAGE AERATOR**

**Harold Beard, P.O. Box 3838, Baton Rouge, La. 70821**

**Filed Oct. 5, 1981, Ser. No. 308,279**

**Int. Cl.³ C02F *1/74;* B01F *5/04***

**U.S. Cl. 210—198.1** **1 Claim**



1. An aerator for use in oxidizing a liquid stream comprising:

(a) a venturi positioned above said liquid stream having an upper cavity and lower restricted opening chamber, said venturi having a stream inlet port opening into said cavity;

(b) a hollow pipe attachable to said venturi and extending into said cavity; and,

(c) a diffuser assembly attached to the lower end of said hollow pipe and comprising a hollow tube section having a tube opening, said diffuser assembly comprising:

i. said hollow tube section being detachable from said hollow pipe;

ii. a conical-shaped hollow pipe attached by the base of said conical-shaped hollow pipe to said hollow tube section;

iii. vanes attached at one end to said hollow tube section and extending downward and inward below said conical-shaped hollow pipe wherein they are attached at their opposite end to an agitator.

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**4,389,313**

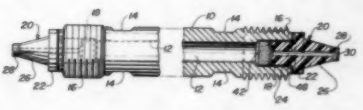
**CHROMATOGRAPHIC COLUMN WITH IMPROVED SEALS**

**Andrew R. Charney, State College; Paul W. Kercher, Pennsylvania Furnace, and Stanley A. Stone, State College, all of Pa., assignors to Scientific Systems, Inc., State College, Pa.**

**Filed Dec. 9, 1981, Ser. No. 328,907**

**Int. Cl.³ B01A *15/02***

**U.S. Cl. 210—198.2** **7 Claims**



1. A chromatographic column comprising in combination:

(1) a tubular column cartridge having at least one end threaded exteriorly and the interior of said end being arranged to receive one end of a seal member,

(2) a column seal member attachable to said at least one end of said column cartridge and comprising:

a. a body circular in cross-section and having a central straight-through passage from end-to-end of uniform diameter and also having opposite end portions,

b. an annular rib on said body intermediately of the end portions thereof and provided with opposed surfaces to be clamped,

c. one end portion of said body being substantially cylindrical and complementary to and receivable within said one end of said column cartridge,

d. the other end portion of said body being frusto-conical and tapering away from said rib,

(3) an apertured coupling having a cavity in one end complementary to the exterior of said other end portion of said body and adapted to receive the same in sealing relationship,

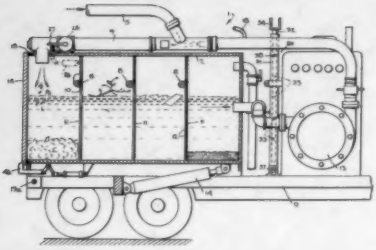
(4) a seat in said cavity, and

(5) threads in the cavity of said coupling complementary to the exterior threads on said one end of said column and operable to threadably receive the same and connect at least one end of said column cartridge to the cavity end of said coupling in a manner to clamp the annular rib of said seal member to said column cartridge and said coupling by the clamping surfaces of said annular rib being clampingly engaged between said threaded end of said column cartridge and said seat in the cavity of said coupling and said frusto-conical end of said seal member closely filling said cavity inwardly from said seat therein.

## 4,389,314
## EDUCTOR TRUCK

Anthony V. Petretti, Whitestone, N.Y., assignor to Metro Hoist & Body Co., Inc., Whitestone, N.Y.

Filed May 21, 1979, Ser. No. 40,551
Int. Cl.³ C02C 1/18
U.S. Cl. 210—241 2 Claims



1. An eductor truck comprising a frame, a settling tank pivotally mounted on said frame, said settling tank having an eductor unit thereon, a control valve mounted on said settling tank for operating said eductor unit, said control valve being operable from a point remote from its position on the settling tank, said control valve having a control arm extending therefrom, said control arm being located outside of said eductor unit whereby it is accessible for optional manual operation, a hydraulic motor mounted adjacent the settling tank to operate the control valve, said hydraulic motor having a piston which is operatively connected to the control arm of said control valve, said hydraulic motor being remotely controlled, whereby remote operation of said hydraulic motor will operate said control valve through said control arm.

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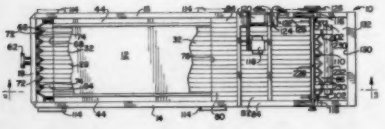
## 4,389,315
## FILTER DEVICE WITH PERMEABLE CORRUGATED GRID PANEL

Frank Crocket, 36393 Greenspring, Farmington Hills, Mich. 48018

Filed Jul. 24, 1981, Ser. No. 286,563
Int. Cl.³ B01D 33/22
U.S. Cl. 210—357 9 Claims



1. A filter device for separating foreign material from a liquid flow, said device comprising,

a tank for receiving said flow of said liquid and foreign material through an inlet means, and outlet means for discharging said foreign material and the filtered liquid,

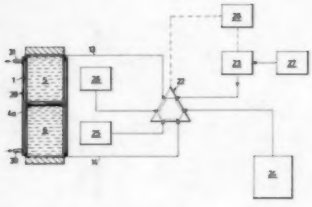
a grid panel having permeable corrugated surface carried within said tank to allow passage of said liquid while retaining said foreign material to collect on said corrugated surface, said permeable corrugated surface including a series of permeable filter surfaces interconnected at respective tops and bottoms to form acute angles between said permeable filter surfaces at each such connection, and

a conveyor operatively connected to said tank, said conveyor having a scraper plate with an edge to complementally engage said grid panel corrugated surface and remove said foreign material collected thereon.

## 4,389,316
## METHOD AND A DEVICE FOR LIQUID CHROMATOGRAPHY

Bengt G. Falk, Upsala, Sweden, assignor to Pharmacia Fine Chemicals AB, Upsala, Sweden

Filed May 13, 1981, Ser. No. 263,128
Claims priority, application Sweden, May 14, 1980, 8003645
Int. Cl.³ B01D 15/08
U.S. Cl. 210—656 8 Claims



1. An arrangement for applying a sample solution on a liquid chromatographic column, comprising

(a) a sample container having uniform cross section,

(b) a piston adapted to move along the axis of said container, sealingly contacting the side walls of the container and dividing the container into a driving solution chamber and a sample solution chamber,

(c) a first passageway for the introduction and removal of driving solution to and from said driving solution chamber,

(d) a second passageway for the introduction and removal of sample solution to and from said sample solution chamber,

(e) pumping means for pumping a driving solution into said driving solution chamber through said first passageway,

(f) a sample solution reservoir and conduits connecting said reservoir to said second passageway,

(g) at least one driving solution reservoir and conduits connecting said reservoir to said first passageway,

(h) a chromatographic column, and

(i) a valve means (A) interconnecting said sample solution reservoir and said sample solution chamber and (B) interconnecting said driving solution reservoir with said driving solution chamber and (C) interconnecting said pumping means to said driving solution chamber and (D) interconnecting said pumping means with said chromatographic column so that

(1) when driving solution is pumped into the driving solution chamber it will displace the piston so as to decrease the volume of the sample solution chamber and discharge from the sample solution chamber an amount of sample solution to the chromatographic column which is directly proportional to the amount of driving solution pumped into said driving solution chamber, and

(2) when sample solution is pumped from the sample solution reservoir into the sample solution chamber it will move the piston so as to decrease the volume of the driving solution chamber.

4,389,317

## PROCESS FOR CHEMICAL REDUCTION OF THE PHOSPHATE CONTENT OF WATER

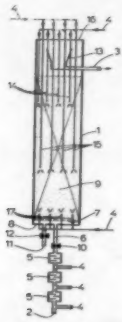
Christiaan C. M. Treutelman; Johannis C. van Dijk, both of Leusden, and Johannes H. C. M. Oomen, Amersfoort, all of Netherlands, assignors to DHV Raadgevend Ingenieursbureau BV, Netherlands

Continuation of Ser. No. 39,593, May 16, 1979, abandoned. This application May 11, 1981, Ser. No. 262,419

Claims priority, application Netherlands, May 18, 1978, 7805358

Int. Cl.³ C02F 1/52; B01D 9/02

U.S. Cl. 210—715 2 Claims



1. A process for the chemical reduction of the dissolved phosphate content of a stream of water containing the dissolved phosphate, which comprises;

passing the stream of water at a velocity of from 30 to 200 m/h through a bed of seed grains, said seed grains ranging in size from 0.1 to 3 mm., whereby said bed of seed grain is fluidized by the passing stream;

providing at least one reagent which will react with the dissolved phosphate to form crystals of a phosphate compound; and

adding the provided reagent to the stream at several sites spread over the height of the fluidized bed;

whereby granules of crystalline material are obtained by crystallization and build-up of said phosphate compound onto the seed grains, said granules being readily separated from the stream as virtually water-free granules.

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4,389,318

## RAPIDLY DISSOLVING MIXTURES CONTAINING TRICHLOROISOCYANURIC ACID

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 30, 1981, Ser. No. 248,133

Int. Cl.³ C02F 1/76

U.S. Cl. 210—755 11 Claims

8. A composition in compressed form for sanitizing water bodies consisting essentially of a mixture of trichloroisocyanuric acid, an alkali metal bicarbonate and cyanuric acid said mixture having a molar ratio of said alkali metal bicarbonate to said trichloroisocyanuric acid of from about 3:1 to about 1:1, a mole ratio of said cyanuric acid to said trichloroisocyanuric acid in the range of from about 0.05:1 to about 0.75:1, said mixtures containing at least about 50 percent by weight of said trichloroisocyanuric acid, and having a moisture content of less than about 0.2 percent by weight of the mixture.

10. A method of sanitizing a water body having a temperature in the range of from about 12° to about 43° C. which comprises adding to said water body the composition of claim 8.

4,389,319

## HIGH TEMPERATURE STABLE VISCOSIFIER AND FLUID LOSS CONTROL SYSTEM

Jacob Block, Rockville, and Peter C. Green, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,460

Int. Cl.³ C09K 7/02

U.S. Cl. 252—8.5 A 7 Claims

1. A composition capable of imparting to clay-free aqueous systems a combination of pseudoplasticity and fluid loss control comprising a mixture of:

(a) a hydroxy containing aluminum component formed by mixing in an aqueous medium and under a high degree of agitation a water-soluble basic agent selected from the group consisting of an alkali metal aluminate, alkali metal hydroxide, ammonium hydroxide and mixtures thereof with a water-soluble acidic agent selected from an inorganic acid, aluminum chloride, aluminum sulfate, aluminum nitrate, their hydrates and mixtures thereof; at least one of said basic and acidic agents being an aluminum containing compound: said acidic and basic agents being reacted in a ratio such that the resultant product is capable of imparting to an aqueous medium a pH of at least about 8; in combination with

(b) a chemical compound capable of converting to a higher oxidation state under alkaline conditions selected from the group consisting of $C_1$–$C_5$ alkanols, unsubstituted or $C_1$–$C_3$ alkyl, aryl or alkaryl substituted phenols, hydroquinone, $C_1$–$C_{15}$ alkanothiol, alkali metal, alkaline earth metal or ammonium salt of sulfite, bisulfite or nitrite, ferrous metal salts of chloride or sulfate and cuprous metal salts of chloride and sulfate; in combination with

(c) a reaction product formed between a polymeric material having a weight average molecular weight of at least about 20,000 selected from the group consisting of polyvinyl alcohol and hydroxy $C_1$–$C_3$ alkyl cellulose and at least from about 1 to 200 percent of stoichiometry of a crosslinking agent selected from the group consisting of a compound containing at least one aldehyde group therein or a compound capable of generating in situ at least one aldehyde or an epihalohydrin; the reaction between said polymeric material and said aldehyde carried out in an aqueous acidic medium having a pH of 5.5 or less and the reaction between said polymer and said epihalohydrin being carried out in an aqueous basic medium having a pH of at least about 9.5;

wherein the weight ratio of component (a) to (c) is at least from about 0.75:1 to 3:1 and of component (b) to (c) is at least from about 0.2:1 to 1:1.

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4,389,320

## FOAMABLE COMPOSITIONS AND FORMATIONS TREATMENT

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 100,085, Dec. 4, 1979, Pat. No. 4,300,634. This application May 4, 1981, Ser. No. 260,471

Int. Cl.³ E21B 43/24, 43/138

U.S. Cl. 252—8.55 R 9 Claims

1. A foamable gelled composition consisting essentially of

(a) water,

(b) a water-soluble surfactant in an amount which is sufficient to form a stable, self-collapsing foam when the composition is contacted with steam after polymer component (c) breaks down due to heat,

(c) a water-thickening amount of a water-dispersible polymer selected from the group consisting of cellulose ethers, polyacrylamides, polyalkylene oxides, and biopolysaccharides produced by the action of bacteria of the genus Xanthomonas upon carbohydrates,

(d) a small, but effective amount in the range of 0.02 to 2 weight percent, of at least one aldehyde component selected from the group consisting of glyoxal, glutaralde-

hyde, and terephthaldehyde, and aliphatic monoaldehydes having from one to about 10 carbon atoms per molecule, and

(e) a small, but effective amount in the range of 0.005 to 2 weight percent of at least one phenolic compound selected from the group consisting of phenol, catechol, resorcinol, phloroglucinol, pyrogallol, 4,4'-diphenol, 2,3-dihydroxynaphthalene, 1,4-benzoquinone, hydroquinone, quinhydrone, and quebracho which amounts of aldehyde (d) and phenolic compound (e) are sufficient to cause gelation of an aqueous dispersion of polymer (c) and form said gelled composition.

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**4,389,321**

## 2,3-DIHYDROPERIMIDINES AS ANTIOXIDANTS FOR LUBRICANTS

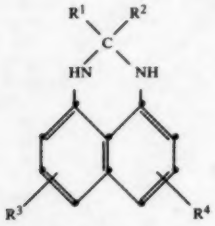
**Roger F. Malherbe, East Northport, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Dec. 28, 1981, Ser. No. 334,860**

**Int. Cl.³ C10M** *1/38, 1/32, 1/44*

**U.S. Cl. 252—47** **5 Claims**

1. A lubricant composition comprising a mineral oil or a synthetic oil or mixtures thereof and an effective stabilizing amount of a compound of formula (I)



(I)

wherein $R^1$ is hydrogen or alkyl having 1 to 20 carbon atoms; $R^2$ is alkyl, phosphono-substituted alkyl, alkyl interrupted by O, alkyl interrupted by S, alkenyl having 3 to 16 carbon atoms, aryl, lower alkyl-substituted aryl, hydroxyl-substituted aryl, halogen-substituted aryl or di(lower) alkylamino-substituted aryl and wherein said alkyl group has from 1 to 20 carbon atoms and said aryl group has from 6 to 10 carbon atoms or $R^1$ and $R^2$ together with the carbon atom to which they are attached form cycloalkane of 5 to 25 carbon atoms, alkylcycloalkane of 6 to 25 carbon atoms or cycloalkylcycloalkane of 9 to 25 carbon atoms; and $R^3$ and $R^4$ independently are hydrogen or alkyl having 1 to 12 carbon atoms or $R^3$ and $R^4$ together are 1,2-ethylene in the peri-position.

5. A lubricant composition according to claim 1, wherein said compound is selected from the group consisting of 2,3-dihydroperimidine-2-spiro(4-t-amyl-cyclohexane), 2,3-dihydropermidine-2-spiro(4-t-butyl-cyclohexane), 2,3-dihydroperimidine-2-spirocyclododecane, 2,3-dihydroperimidine-2-spiro(decahydro-1-naphthalene), 2,3-dihydroperimidine-2-spiro-8'-tricyclo[5.2.1.$0^{2,6}$]decane, 2,2-dinonyl-2,3-dihydroperimidine, 2-methyl-2-(2-methyl-2-diethylphosphonopropyl)-2,3-dihydroperimidine, 2-undecyl-2,3-dihydroperimidine, 2-(1-pentyl-1-octenyl)-2,3-dihydroperimidine, 2-(3,5-di-t-butyl-4-hydroxyphenyl)-2,3-dihydroperimidine, 2,3-dihydroperimidine-2-spiro(2-cyclohexylcyclohexane), 2,3-dihydroperimidine-2-spiro(4-cyclohexylcyclohexane), 2,3-dihydroaceperimidine-2-spiro(4-t-amylcyclohexane), 2,3-dihydroaceperimidine-2-spirocyclododecane, 2,3-dihydroperimidine-2-spirocyclohexane, 2,3-dihydropermidine-2-spiro(4-t-octylcyclohexane), 2-isobutyl-2-(2,4-dimethylphenyl)-2,3-dihydroperimidine and 2-(p-dimethylaminophenyl)-2,3-dihydroperimidine.

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**4,389,322**

## FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

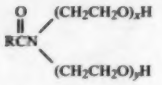
**Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 95,005, Nov. 16, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 276,129**

**Int. Cl.³ C10M** *1/10*

**U.S. Cl. 252—49.6** **11 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or solid lubricant prepared therefrom and a minor friction reducing proportion of an additive compound selected from borated adducts of N-ethoxylated amides having the following generalized structure:



wherein R is hydrocarbyl containing 10–40 carbon atoms selected from alkyl, alkenyl, aralkyl or alkaryl, x and y are whole numbers from 1 to about 10 and where x and y may be the same or different with the proviso that x plus y must be at least 2 or more.

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**4,389,323**

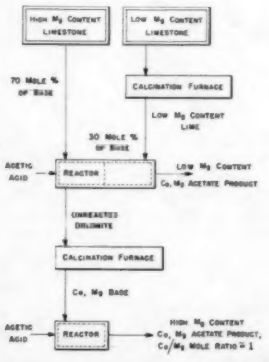
## PROCESS OF MAKING TWO UNIFORM GRADES OF CALCIUM MAGNESIUM ACETATE

**Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207**

**Filed Nov. 2, 1981, Ser. No. 316,816**

**Int. Cl.³ C09K** *3/18;* **C01F** *5/00, 11/00*

**U.S. Cl. 252—70** **6 Claims**




1. In a process of making different grades of calcium magnesium acetate, having substantially uniform but different calcium-to-magnesium mole ratios, from limestone having varying proportions of calcium carbonate and magnesium carbonate, the steps comprising:

a. finely dividing limestone containing calcium carbonate and magnesium carbonate;

b. mixing said finely divided limestone with water to form an aqueous suspension of calcium carbonate and magnesium carbonate;

c. calcining some finely divided limestone;

d. reacting an effective amount of said aqueous suspension not above about 70% of the molar equivalent of base with acetic acid and an effective amount of the calcined limestone not below about 30% of the molar equivalent of base to produce a calcium magnesium acetate salt solution having a calcium-to-magnesium mole ratio much greater than one;

e. separating from said solution substantially all insolubles containing calcium carbonate and magnesium carbonate;
f. calcining said separated insolubles;
g. mixing said calcined insolubles with water to form an aqueous lime suspension; and
h. reacting said lime suspension with acetic acid to produce a calcium magnesium acetate salt solution having a calcium-to-magnesium mole ratio substantially equal to one.

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**4,389,324**

## POLYMERIC COMPOSITION FOR PREVENTING THE FORMATION OF SCALE DURING EVAPORATION OF SUGAR JUICES

**Renate Keller, Düsseldorf, Fed. Rep. of Germany, assignor to Keller & Bobacek GmbH & Co., KG., Düsseldorf-Rath, Fed. Rep. of Germany**

**Continuation of Ser. No. 92,455, Nov. 7, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,247**

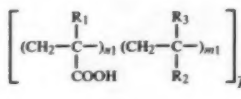
**Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848779**

**Int. Cl.**[3] **C02F** *5/10, 5/12;* **C23F** *14/02*

**U.S. Cl. 252—180** **2 Claims**

1. A polymeric composition for preventing the formation of scale when evaporating fruit juices, which is characterized in that it contains a mixture of at least three polymers, at least two of said polymers being selected from the group consisting of:

(a) polymers and salts of formula I



I

wherein:

$R_1$ is —H, —OH, —$CH_3$, —$CH_2OH$ and/or —Cl

$R_2$ is —CHO, —$CH_2OH$ and/or —$COOCH_2CH_2COOH$

$R_3$ is —H, —$CH_3$ and/or —$CH_2OH$

$n_1$ is 0.5 to 0.95

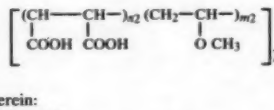
$m_1$ is 0.05 to 0.5

$n_1+m_1=1$, and

$P_1$ is 6 to 300;

and wherein said polymers of formula I differ in the mean degree of polymerisation $P_1$ by at least 20%, based on the value $P_1$ of the polymer with the lowest mean degree of polymerisation; and at least one further polymer selected from the group consisting of:

(b) a polymer or salt of formula II



II

wherein:

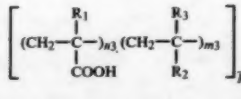
$n_2$ is 0.4 to 1.0

$m_2$ is 0 to 0.6

$n_2+m_2=1$

$P_2$ is 5 to 4000, or a lower alkyl ester thereof;

(c) a polymer or salt of formula III



III

wherein:

$n_3$ is 0.95 to 1

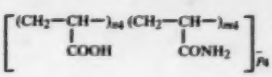
$m_3$ is 0.05 to 0

$n_3+m_3=1$

$P_3$ is 6 to 300

$R_1$, $R_2$ and $R_3$ have the same meaning as in (a);

(d) an anionic polyacrylamide or salt of formula IV



IV

wherein:

$n_4$ is 0.05 to 0.95

$m_4$ is 0.95 to 0.05

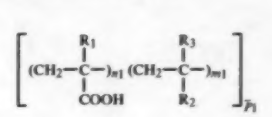
$n_4+m_4=1$

P is 10 to 500

in which at least one of the polymers is present in an amount of at least 10% by weight and at least two of the polymers are present each in an amount of at least 5% by weight, based on the total amount of the polymers.

2. A polymeric composition for preventing the formation of scale when evaporating fruit juices, which is characterized in that it contains a mixture of at least three polymers, at least three of said polymers being selected from the group consisting of:

(a) polymers and salts of formula I



I

wherein:

$R_1$ is —H, —OH, —$CH_3$, —$CH_2OH$ and/or —Cl

$R_2$ is —CHO, —$CH_2OH$ and/or —$COOCH_2CH_2COOH$

$R_3$ is —H, —$CH_3$ and/or —$CH_2OH$

$n_1$ is 0.5 to 0.95

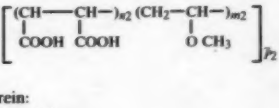
$m_1$ is 0.05 to 0.5

$n_1+m_1=1$, and

$P_1$ is 6 to 300;

and wherein said polymers of formula 1 differ in the mean degree of polymerisation $P_1$ by at least 20%, based on the value $P_1$ of the polymer with, in each case, the lowest mean degree of polymerisation; said remaining polymers being selected from the group consisting of:

(b) a polymer or salt of formula II



II

wherein:

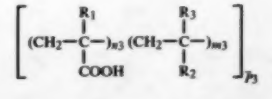
$n_2$ is 0.4 to 1.0

$m_2$ is 0 to 0.6

$n_2+m_2=1$

$P_2$ is 5 to 4000, or a lower alkyl ester thereof;

(c) a polymer or salt of formula III



III

wherein:

$n_3$ is 0.95 to 1

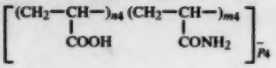
$m_3$ is 0.05 to 0

$n_3+m_3=1$

$P_3$ is 6 to 300

$R_1$, $R_2$ and $R_3$ have the same meaning as in (a);

(d) an anionic polyacrylamide or salt of formula IV



IV

wherein:
$n_4$ is 0.05 to 0.95
$m_4$ is 0.95 to 0.05
$n_4+m_4=1$
P is 10 to 500
in which at least one of the polymers is present in an amount of at least 10% by weight and at least two of the polymers are present each in an amount of at least 5% by weight, based on the total amount of the polymers.

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**4,389,325**

## CHLOROISOCYANURATE COMPOSITIONS

**Clifford D. Eng, University City; James W. Gambell, and Henry K. Yuen, both of St. Louis, all of Mo., assignors to Monsano Company, St. Louis, Mo.**

**Filed Jan. 25, 1982, Ser. No. 342,039**
**Int. Cl.³ C11D *7/54***
**U.S. Cl. 252—186.35** **16 Claims**

1. A composition comprising a solid chloroisocyanurate selected from the group consisting of trichloroisocyanuric acid, dichloroisocyanuric acid, alkali metal salts of dichloroisocyanuric acid and mixtures thereof, and a porous crystalline alumino-silicate having an essentially uniform pore size and a free aperture dimension of at least about 3.5 angstroms, said alumino-silicate being essentially unreactive below 80° C. with said chloroisocyanurate and hydrolysis and decomposition products thereof as determined by accelerating rate calorimetry.

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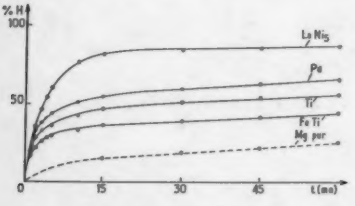
**4,389,326**

## METHOD OF STORING HYDROGEN IN INTIMATE MIXTURES OF HYDRIDES OF MAGNESIUM AND OTHER METALS OR ALLOYS

**Bernard Tanguy, Pessec; Jean-Louis Soubeyroux, Voreppe; Michel Pezat, La Brede; Josik Portier, Pessac, and Paul Hagenmuller, Talence, all of France, assignors to Agence Nationale de Valorization de la Recherche, France**

**Continuation-in-part of Ser. No. 70,175, Aug. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 770,355, Feb. 22, 1977, abandoned. This application Jun. 12, 1981, Ser. No. 272,943**
**Int. Cl.³ C01B *6/00, 6/04***
**U.S. Cl. 252—188.26** **3 Claims**




Hydrogenation at 345°C under 30 bars of Mg alone and of various mixtures Mg-metal or alloy -

1. A process of storing hydrogen in a mixture of hydrides containing magnesium hydride comprising the steps of:
a. mixing magnesium and at least one other metal or alloy or other metals capable of absorbing hydrogen under the conditions of steps d and e, said other metal or alloy being capable of forming hydrides of thermal stability less than that of magnesium hydride, and having a dissociation pressure of at least 1 bar at 20° C., the amount of said other metal or alloy being sufficient to increase the hydrogen absorptive capacity of the total mixture over that of the sum of its parts under the conditions of steps d and e, the components of said mixture having previously been powdered or pulverized;
b. pelletizing thus produced powder;
c. vacuum degasifying the thus produced pellets;
d. placing the pellets in an enclosed empty vessel; and
e. providing hydrogen to said vessel at a predetermined temperature below 350° C. and the melting point of said pelletized mixture and pressure of 20–60 bars to permit absorption of the hydrogen upon the pellets.

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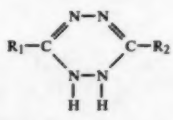
**4,389,327**

## USE OF SELECTED 1,2-DIHYDRO-1,2,4,5-TETRAZINES AS OXYGEN-SCAVENGING AGENTS

**Eugene F. Rothgery, North Branford, and Robert N. Scott, Wallingford, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Jun. 14, 1982, Ser. No. 387,989**
**Int. Cl.³ C09K *15/16, 15/18***
**U.S. Cl. 252—188.28** **7 Claims**

1. A method for removing dissolved oxygen in a liquid system, which comprises
adding to said liquid system an effective amount of an oxygen-scavenging chemical selected from 1,2-dihydro-1,2,4,5-tetrazines of the formula



wherein $R_1$ and $R_2$ are individually selected from the group consisting of lower alkyl groups having 1 to 4 carbon atoms and phenyl.

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**4,389,328**

## DRIER SYSTEMS FOR WATER-BORNE SURFACE-COATING COMPOSITIONS

**Samuel J. Bellettiere, Piscataway; Raymond Hurley, New Brunswick, both of N.J., and Samuel Hoch, Brooklyn, N.Y., assignors to Nuodex, Inc., Piscataway, N.J.**

**Division of Ser. No. 205,834, Nov. 10, 1980, Pat. No. 4,311,625. This application Aug. 24, 1981, Ser. No. 295,396**
**Int. Cl.³ C09K *3/00***
**U.S. Cl. 252—194** **3 Claims**

1. A drier system for water-borne surface-coating compositions containing oxidizable organic film-forming resinous vehicles that has a total metal content of from 5% to 14% by weight and that is a solution comprising a complex that is the product of the reaction of a cobalt salt of a monocarboxylic acid having 2 to 24 carbon atoms with a potassium salt of a monocarboxylic acid having 2 to 24 carbon atoms in amounts that will provide 2 moles of said potassium salt per mole of said cobalt salt, a calcium salt, and a zirconium salt, said calcium and zirconium salts being salts of acids selected from the group consisting of aliphatic branched-chain monocarboxylic acids having 6 to 24 carbon atoms, cycloaliphatic monocarboxylic acids having 6 to 10 carbon atoms, and mixtures thereof, in a solvent mixture that contains from 20% to 80% by weight of polar solvent and 20% to 80% by weight of non-polar solvent.

4,389,329

## METEROCYCLIC COMPOUNDS

Arthur Boller, Binningen; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

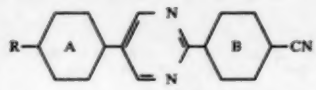
Division of Ser. No. 116,518, Jan. 29, 1980, Pat. No. 4,273,929. This application Jan. 30, 1981, Ser. No. 230,074

Claims priority, application Switzerland, Feb. 5, 1979, 1102/79; Jun. 27, 1979, 5996/79; Nov. 13, 1979, 101126/79

Int. Cl.³ C09K 3/34; G02F 1/13

U.S. Cl. 252—299.1 24 Claims

2. A liquid crystalline mixture comprising one or more pyrimidine derivatives of the formula




I

wherein at least one of the rings A and B is a trans-1,4-disubstituted cyclohexane ring and the other optionally is aromatic and R is straight-chain alkyl or alkoxy of 1 to 10 carbon atoms or a branched-chain alkyl of the formula $C_2H_5$—CH(CH-3)—$(CH_2)_n$— wherein n is 1,2 or 3, and one or more substances selected from the group consisting of nematic liquid crystal compounds, cholesteric liquid crystal compounds, smectic liquid crystal compounds and dichroic coloring compounds.

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4,389,330

## MICROENCAPSULATION PROCESS

Thomas R. Tice, Helena, and Danny H. Lewis, Gardendale, both of Ala., assignors to Stolle Research and Development Corporation, Cincinnati, Ohio

Filed Oct. 6, 1980, Ser. No. 194,127

Int. Cl.³ B01J 13/02; A61K 9/50

U.S. Cl. 427—213.36 17 Claims

1. A method of preparing microcapsules laden with an active agent, comprising:

(a) dissolving or dispersing an active agent in a solvent and dissolving a wall forming material in said solvent;

(b) dispersing said solvent containing said active agent and wall forming material in a continuous-phase processing medium;

(c) evaporating from 10 to 90 weight % of said solvent from said dispersion of step (b), thereby forming microcapsules containing said active agent in the suspension; and

(d) extracting the remainder of the solvent from said microcapsules.

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4,389,331

## PROCESS FOR PREPARING PHARMACEUTICALLY ACTIVE COMPOUND-CONTAINING MICROCAPSULES

Masayoshi Samejima, Minoh; Goichi Hirata, Yawata, and Yoshiyuki Koida, Katano, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Oct. 7, 1980, Ser. No. 194,809

Claims priority, application Japan, Oct. 31, 1979, 54-141826

Int. Cl.³ B01J 13/02; A61K 9/50

U.S. Cl. 427—213.3 7 Claims

1. A process for preparing microcapsules containing a pharmaceutically active compound comprising: dissolving

(a) about 0.02 to about 5 g per gram of said compound of ethylcellulose, and

(b) about 0.0002 to about 1 g per gram of the total of said ethylcellulose plus said compound of phospholipids

in cyclohexane, dispersing articles of the compound in said solution, cooling the dispersion under continuous stirring until the ethylcellulose separates out from the dispersion, thereby coating the particles of compound, and then recovering the microcapsules formed.

4,389,332

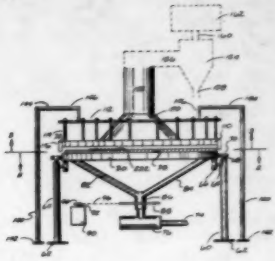
## APPARATUS AND A PROCESS FOR HEATING MATERIAL

Donald R. Ross, Box 430, Umatilla, Oreg. 97882

Division of Ser. No. 787,713, Apr. 14, 1977, Pat. No. 4,263,163. This application Mar. 5, 1980, Ser. No. 127,473

Int. Cl.³ C04B 31/22, 31/26; F27B 14/00

U.S. Cl. 252—378 R 6 Claims



1. A process for expanding discrete solid particles in a mixture of said discrete solid particles to make expanded discrete solid particles, said process comprising:

a. contacting said discrete solid particles in said mixture of said discrete solid particles with a hot surface and with combustible materials juxtapositioned to said hot surface and said combustible materials being intermixed with said discrete solid particles and said combustible materials undergoing combustion among said discrete solid particles; and,

b. reflecting heat energy radiating from said hot surface toward said discrete solid particles and said hot surface to assist in expanding said discrete solid particles to make said expanded discrete solid particles.

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4,389,333

## BISGUANAMINE

Peter Werle, Gelnhausen; Wolfgang Merk; Gerhard Pohl, both of Hanau, and Friedhelm Hoevels, Freigericht, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

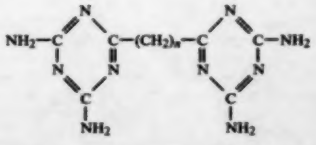
Division of Ser. No. 146,247, May 5, 1980, Pat. No. 4,339,578. This application Feb. 5, 1982, Ser. No. 346,255

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919496

Int. Cl.³ C09K 15/16; C07D 251/18

U.S. Cl. 252—401 19 Claims

1. An aqueous formaldehyde solution containing a stabilizing effective amount of an alkylene bisguanamine of the formula




where n is an integer of 10 to 20.

4,389,334

## SUPPORTED CATALYSTS USEFUL FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Raymond J. Weinert, Jr., and Kenneth C. Benton, both of Garfield Heights, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 31, 1980, Ser. No. 221,667
Int. Cl.³ B01J *31/02*
U.S. Cl. 252—429 B 10 Claims

1. A catalyst comprising a Ziegler-type transition metal complex and a non-rubber support which has been treated with a Group IIA metal halide or Group IIA metal alkyl halide, the support comprising an interpolymer of an alpha, beta-unsaturated dicarboxylic acid, anhydride or ester thereof and a monomer copolymerizable therewith.

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4,389,335

## CATALYST FOR CARBON MONOXIDE CONVERSION IN SOUR GAS

Jay S. Merriam, LaGrange, and Cecil B. Hogg, Louisville, both of Ky., assignors to United Catalysts Inc., Louisville, Ky.

Filed Apr. 14, 1981, Ser. No. 253,941
Int. Cl.³ B01J *23/34, 23/88*
U.S. Cl. 252—439 10 Claims

1. Sulfactive CO conversion catalyst, which comprises:
A. an aluminous catalyst carrier;
B. catalytically active metal compounds including the oxides and sulfides of cobalt and molybdenum;
C. a promotional amount of an alkali metal compound;
D. a promotional amount of an oxide or a sulfide of manganese.

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4,389,336

## PREPARATION OF NAPHTHALENE-OXIDATION CATALYST BY IMPREGNATION OF SILICA WITH AQUEOUS SOLUTION OF $VOC_2O_4$—$K_2SO_4$—$KHSO_4$

Philip H. Harju, Spring Church, and Eugene A. Pasek, Export, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 17, 1981, Ser. No. 303,169
Int. Cl.³ B01J *27/02*
U.S. Cl. 252—440 29 Claims

1. Catalytic material provided by a mixture of compounds deposited upon a silica support, said material prepared by a process comprising:
adding an aqueous solution of salts, comprising vanadyl oxalate, potassium sulfate and potassium bisulfate, to porous silica support to form a substantially free-flowing dry-appearing salt-impregnated silica powder, the powder characterized in having substantially all of said salts contained within pores of the silica powder;
whereby the salt-impregnated silica powder after calcining yields particles of catalytic material over a range of sizes, which particles are characterized in having a substantially uniform chemical composition.

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4,389,337

## PROMOTED ZINC TITANATE CATALYST FOR THE DEHYDROGENATION OF ORGANIC COMPOUNDS

Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 125,436, Feb. 28, 1980, Pat. No. 4,327,238. This application Jan. 18, 1982, Ser. No. 340,401
Int. Cl.³ B01J *21/06, 23/06, 23/10, 23/18*
U.S. Cl. 252—462 10 Claims

1. A catalyst composition comprising zinc, titanium and at least one promoter selected from the group consisting of antimony, bismuth, the lanthanides, the actinides, oxides thereof, and compounds convertible to the oxides thereof, wherein the concentration by weight of said at least one promoter in said catalyst composition is less than the total concentration by weight of said zinc and said titanium in said catalyst composition, wherein said zinc and titanium are present in said catalyst composition in the form of zinc titanate which is prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of free oxygen at a temperature in the range of about 650° C. to about 1050° C. and wherein said catalyst composition does not contain a metal selected from the group consisting of Group IB of the Periodic Table and Group VIIB of the Periodic Table.

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4,389,338

## METHOD FOR MANUFACTURE OF SILVER CATALYST FOR PRODUCTION OF ETHYLENE OXIDE

Masashi Mitsuhata, Yokohama; Shin-ichi Nagase, Tokyo; Takahiko Nakai, and Toshihiko Kumazawa, both of Yokohama, all of Japan, assignors to Nippon Skokubai Kagaku Kogyo Co., Ltd., Japan

Filed Dec. 17, 1981, Ser. No. 331,576
Claims priority, application Japan, Dec. 26, 1980, 55-183935
Int. Cl.³ B01J *23/04, 23/08, 23/50*
U.S. Cl. 252—463 23 Claims

1. In a method for the manufacture of a silver catalyst having silver deposited on a porous inorganic carrier in conjunction with at least one reaction accelerator selected from the group consisting of alkali metals and thallium to be used for the production of ethyelene oxide, the improvement comprising the steps of depositing silver on the porous inorganic carrier in conjunction with at least one reaction accelerator selected from the group consisting of alkali metals and thallium thereby preparing an activated silver catalyst and subsequently subjecting said silver catalyst to a high-temperature treatment at a temperature in the range of 550° to 950° C. in an inert gaseous atmosphere having an oxygen concentration of not more than 3 volume percent in the final step.

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4,389,339

## PROCESS FOR MAKING A COBALT OXIDE CATALYST

Leonard E. James, Richmond; Lamberto Crescentini, and William B. Fisher, both of Chester, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 87,593, Oct. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 926,178, Jul. 20, 1978, abandoned. This application Mar. 1, 1982, Ser. No. 353,687
Int. Cl.³ B01J *23/74*
U.S. Cl. 252—472 10 Claims

1. A process for making a cobalt oxide catalyst comprising heating a substance from which cobalt oxide can be formed to a first elevated temperature sufficient to decompose said substance and produce a first porous mass of cobalt oxide, saturating the porous mass with a concentrated aqueous solution of cobalt nitrate, heating the resulting saturated mass at a second elevated temperature for a period of time sufficient to complete the reaction and produce a second porous mass of cobalt oxide having improved crushing strength, and grinding the second porous mass to produce a particulate cobalt oxide catalyst having high activity and improved resistance to disintegration during ammonia oxidation.

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4,389,340

## FLEXIBLE, ELECTRICALLY CONDUCTIVE JOINTING MATERIAL, PARTICULARLY SUITABLE FOR AIRCRAFT

Fernand J. Levy, Puteaux, France, assignor to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France

Filed Aug. 6, 1980, Ser. No. 175,853
Claims priority, application France, Aug. 10, 1979, 79 20499
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—512 4 Claims

1. A composition of matter, for application to aircraft structural parts made of aluminum or aluminum alloy, comprising a flexible electrically-conductive jointing material consisting of a resilient electrically-insulating matrix formed of an elastomer selected as being, upon application at the desired site of the

aircraft, of pasty consistency adapted for spreading and molding in situ, and of generally rectangular particles of aluminum or aluminum alloy distributed throughout said matrix and formed of scales having on average a length of approximately 2 to 4 millimeters, a width of approximately 100 to 150 microns and a thickness of approximately 30 to 60 microns, the proportion of scales in the elastomer being approximately of 1:4 parts by weight.

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**4,389,341**

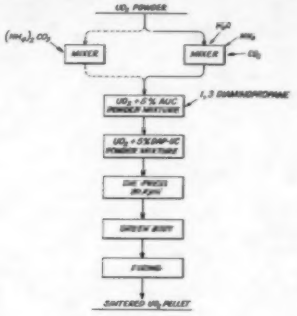
## FUGITIVE BINDER-CONTAINING NUCLEAR FUEL MATERIAL AND METHOD OF PRODUCTION

**George L. Gaines, Jr., Scotia, and William J. Ward, III, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 15, 1981, Ser. No. 273,900**

**Int. Cl.³ C09K 3/00; G21C 21/00**

**U.S. Cl. 252—638** **13 Claims**




1. In the method of producing a sintered body of nuclear fuel material, including the steps of pressing a particulate mixture of nuclear fuel material and ammonium uranyl compound binder to form a green body compact and thereafter sintering the compact, the combination of the step prior to the pressing step of reacting the ammonium uranyl compound with an amine compound to displace ammonia and form in the mixture a water-soluble uranyl compound as a binder for the mixture.

6. Nuclear fuel particulate material having on the surface thereof an amount of water-soluble product of the reaction between an amine and ammonium uranyl carbonate, said amount being in the range of from about 0.5 to 7 percent by weight.

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**4,389,342**

## SYNTHETIC HORMONE-LIKE PEPTIDES AND METHOD FOR THEIR SYNTHESIS

**Friedrich Reinhard, Munich, Fed. Rep. of Germany, assignor to Perignon Investments, Ltd., Georgetown, Cayman Islands**

**Continuation-in-part of Ser. No. 136,670, Apr. 2, 1980, which is a continuation-in-part of Ser. No. 82,738, Oct. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 50,408, Jun. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 916,874, Jun. 19, 1978, abandoned. This application Apr. 23, 1981, Ser. No. 256,695**

**Int. Cl.³ C07C 103/52**

**U.S. Cl. 260—112.5 R** **5 Claims**

1. A hormone-like peptide having antimetabolic activity comprising a peptide of the formula

$$a\text{-}X_1\text{-Arg-Val-}X_2\text{-(Gln)}_m\text{-(Val)}_n\text{-(Gly)}_o\text{-}(X_3)_p\text{-}(X_4)_q\text{-(Pro)}_r\text{-}(X_5)_s\text{-}c$$

wherein

a is a member of the group consisting of a free amino group and an acylated amino group,

c is a member of the group consisting of a free carboxylic acid group, a carboxylic acid amide group, and a carboxylic acid ester group

$X_1$ is Pyr or Phe,

$X_2$ is Lys, Tyr or Phe,

$X_3$ is Ser, Tyr, or Phe

$X_4$ is Ser or Tyr,

$X_5$ is Gln or Asn, and

m, n, o, p, q, r and s are integers of 0 or 1, with the proviso that $m \geq n \geq o \geq p \geq q \geq r \geq s$; with the further provisos that:

when $X_1$ is Phe then $X_2$ is Lys, $X_3$=$X_4$=Ser, and m=n=o=p=q=r=1 and s=0;

when $X_2$ is Tyr or Phe, then $X_3$=$X_4$=Ser, $X_5$=Gln, and m=n=o=p=q=r=s=1;

when $X_3$ is Tyr or Phe, then $X_4$ is Ser, $X_5$ is Gln and m=n=o=p=q=r=s=1; and

when $X_4$ is Tyr, then $X_5$ is Gln and m=n=o=p=q=r=s=1; and when n=1, then o=1.

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**4,389,343**

## IMMUNOPOTENTIATING PEPTIDES FROM THYMUS

**Bernard L. Horecker, New York, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**Filed Dec. 24, 1981, Ser. No. 334,420**

**Int. Cl.³ C07C 103/52**

**U.S. Cl. 260—112.5 R** **4 Claims**

1. Polypeptides essentially free of other proteinacious material and having the following amino acid sequence:

1 5
Ac—Ala—Asp—Lys—Pro—Asp—Leu—Gly—Glu—Ile—

10 15
—Asn—Ser—Phe—Asp—Lys—Ala—Lys—Leu—Lys—Lys—

20 25
—Thr—Glu—Thr—Gln—Glu—Lys—Asn—Thr—Leu—Pro—

30 35
—Thr—Lys—Glu—Thr—Ile—Glu—Gln—Glu—Lys—Gln—R

wherein Ac represents N-acetyl and R represents —OH or —Ala—Lys—OH

and the pharmaceutically acceptable acid addition salts or base salts thereof.

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**4,389,344**

## PROCESS FOR SEPARATING SOLID 1,5- AND/OR 1,8-DINITROANTHRAQUINONE AND LIQUID NITROBENZENE

**Axel Schaefer, Bonn; Werner Motika, Leverkusen; Wolfgang Bender, Burscheid; Jörn Todt, Leverkusen, and Udo Oels, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 29, 1979, Ser. No. 99,115**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854427**

**Int. Cl.³ C07C 49/68**

**U.S. Cl. 260—369** **8 Claims**

1. A process for obtaining dry 1,5- and/or 1,8-dinitroanthraquinone from suspensions which contain solid 1,5- and/or 1,8-dinitroanthraquinone and liquid nitrobenzene, comprising separating off mechanically from the suspension at elevated temperature in a first stage, solid 1,5- and/or 1,8-dinitroanthraquinone with a nitrobenzene content of less than 30% by weight and removing in a second stage, the residual nitrobenzene from the 1,5- and/or 1,8-dinitroanthraquinone which has been separated off, by lowering the pressure during which the temperature falls.

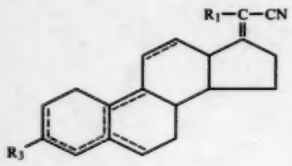
**4,389,345**

## 3-OXOESTRA-17-ACETONITRILE AND UNSATURATED ANALOGS

George R. Lenz, Glenview, Ill., assignor to G.D. Searle & Co., Skokie, Ill.

Filed Oct. 9, 1981, Ser. No. 310,204
Int. Cl.³ C07J 7/00
U.S. Cl. 260—397.1 15 Claims

1. A compound of the formula:



wherein $R_1$ is:
(a) hydrogen;
(b) phenyl alkyl carboxylic acid ester, the alkyl portion having 1 to 6 carbon atoms inclusive;
wherein $R_3$ is
(a) oxo
(b) =NOH;
(c) —$OR_4$; or
(d) —OC=O($R_4$)
wherein $R_4$ is
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms inclusive.

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**4,389,346**

## ESTERIFICATION REACTION PRODUCTS AND COSMETICS CONTAINING SAME

Osamu Yamada, Yokohama; Yuzo Higaki, Machida, and Akitoshi Ukai, Yokohama, all of Japan, assignors to The Nisshin Oil Mills, Limited, Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,405
Claims priority, application Japan, Feb. 18, 1980, 55-17761
Int. Cl.³ C11C 3/02
U.S. Cl. 260—410.7 4 Claims

1. An esterification reaction product between a condensate of a polyhydric alcohol having 2–4 hydroxyl groups, represented by the general formula,

$$(HO)_nR—O—R(OH)_n$$

wherein R is a polyhydric alcohol of 2–4 hydroxyl groups having removed hydroxyl groups and n is 1, 2, or 3 and an acid mixture comprising 12-hydroxystearic acid and a rosin constituting resin acid whose content is not more than 50 mol % based on the total of 12-hydroxystearic acid and rosin constituting resin acid and does not have more than half the hydroxyl groups of said condensate of the polyhydric alcohol.

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**4,389,347**

## SYNTHESIS OF HETERONUCLEAR TRI-OSMIUM CARBONYL HYDRIDES UNDER GASEOUS HYDROGEN

Sheldon G. Shore, and Wen-Liang Hsu, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Nov. 18, 1981, Ser. No. 322,447
Int. Cl.³ C07F 11/00, 15/02, 15/04, 15/06
U.S. Cl. 260—429 CY 40 Claims

1. A process for producing a tri-osmium heteronuclear metal carbonyl compound, which comprises establishing, in the presence of gaseous hydrogen, a reaction mixture comprising an electron deficient cobalt, nickel, iron, molybdenum or rhodium carbonyl, $H_2Os_3(CO)_{10}$ and a solvent which at least partially solubilizes at least one of said electron deficient carbonyl and said $H_2Os_3(CO)_{10}$, said reaction mixture being established in the substantial absence of molecular oxygen and water, and recovering said tri-osmium heteronuclear metal carbonyl compound from said reaction mixture.

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**4,389,348**

## SELECTIVE HYDROGENATION OF DINITRILE TO OMEGA-AMINONITRILE AND SUPPORTED RHODIUM-CONTAINING CATALYST THEREFOR

Steven E. Diamond, New Providence; Frank Mares, Whippany, both of N.J., and Andrew Szalkiewicz, New York, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 26, 1981, Ser. No. 314,902
Int. Cl.³ C07C 121/43
U.S. Cl. 260—465.5 R 10 Claims

1. A process for producing an omega-aminonitrile which comprises reacting at a reaction temperature of between about 20° and about 200° C. a dinitrile of the formula N≡C—$(CH_2)_n$—C≡N with n being an integer from 1 to 10 with hydrogen at a partial pressure of at least about one atmosphere in the presence of:
(a) ammonia in a molar amount at least equal to the molar amount of dinitrile present,
(b) an aprotic solvent for the dinitrile, and
(c) a rhodium-containing catalyst prepared by hydrolyzing a rhodium(III) halide on a basic support selected from the group consisting of basic thoria, alkaline earth metal oxides and alkaline earth metal carbonates with strong aqueous base at a first temperature between about 50° C. and about 100° C. to produce a supported rhodium hydroxide, drying the supported rhodium hydroxide at subatmospheric pressure and a second temperature between about 50° C. and about 250° C., and hydrogenating the dried rhodium hydroxide at a third temperature between about 200° and about 400° C.; and recovering the omega-aminonitrile of the formula N≡C—$(CH_2)_n$—$CH_2$—$NH_2$ as the major product.

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**4,389,349**

## PROCESS FOR PREPARING OF N-PHOSPHENOMETHYL GLYCINE

Hung H. Cho, 303-8-4-1 Sec.3, Nanking E. Rd., Taipei, and Min F. Chen, No. 6, Lane 430 Sec. 1, Taichung-Kan Taichung, both of Taiwan

Filed Jan. 25, 1982, Ser. No. 342,723
Int. Cl.³ C07F 9/38
U.S. Cl. 260—502.5 F 10 Claims

1. A process for producing N-phosphenomethyl glycine comprising:
(a) Reacting an alkyl glycinate hydrochloride in an alcoholic solution with paraformaldehyde in the presence of hydrogen chloride, while removing water from the reaction system, to produce alkyl glycinate methylene chloride;
(b) Reacting said alkyl glycinate methylene chloride with a compound of the formula $X_2P_2POH$, wherein X represents a phenoxy or $C_1$–$C_4$ alcoxy radical, under anhydrous conditions and in the presence of an acid absorber to form a di-substituted phosphenomethyl alkyl glycinate and a chloride salt which is removed;
(c) Saponifying said di-substituted phosphenomethyl alkyl glycinate at elevated temperature with sodium hydroxide to form a sodium salt thereof; and
(d) acidifying said salt to form N-phosphenomethyl glycine.

## 4,389,350
## PREPARATION OF O,S-DIALKYL PHOSPHOROAMIDOTHIOATES

**Jack J. Lonsinger, Liberty, and Chester W. Halbleib, Holt, both of Mo., assignors to Mobay Chemical Corporation, Kansas City, Mo.**

**Filed May 19, 1981, Ser. No. 265,046**
**Int. Cl.³ C07F 9/24**
**U.S. Cl. 260—989** **9 Claims**

1. In the isomerization of an O,O-dialkyl phosphoroamidothioate to an O,S-dialkylphosphoroamidothioate by heating the O,O-dialkyl starting material in the presence of a catalyst, followed by recovery of the desired O,S-dialkyl end product, the improvement which comprises arresting the heating when about 40 to 70% of the O,O-dialkyl starting material has isomerized to O,S-dialkyl product, separating unreacted O,O-dialkyl starting material from O,S-dialkyl isomerization product, and further treating the O,O-dialkyl starting material to effect further isomerization.

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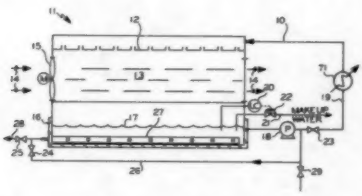
## 4,389,351
## REMOVAL OF SOLIDS FROM A COOLING TOWER BASIN

**Sharon R. O'Brien, Old Ocean, Tex. (now by change of name from Sharon R. Fore), assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 22, 1981, Ser. No. 285,701**
**Int. Cl.³ B01D 47/00**
**U.S. Cl. 261—36 R** **9 Claims**




1. A method for removing contaminating substances in a cooling tower basin from the cooling tower basin which substances have been contained in the water fed to the cooling tower for cooling, said method comprising:

(a) passing an aqueous flush fluid in to the cooling tower basin through a perforated flush tube means which extends into the cooling tower basin at, in or near the bottom of said cooling tower basin,

(b) agitating and mixing substances in the cooling tower basin with the aqueous flush fluid of (a) to form a mixture comprising said substances and water, and

(c) withdrawing said mixture from the bottom of the cooling tower basin via said same perforated flush tube means.

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## 4,389,352
## COOLING PAD SUPPORT ASSEMBLY

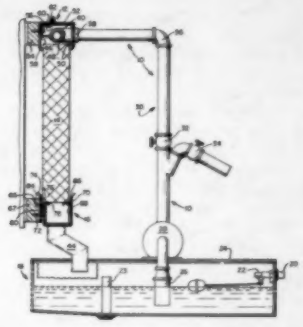
**Hoy R. Bohanon, Sr., Muskogee, Okla., assignor to Acme Engineering & Manufacturing Corporation, Muskogee, Okla.**

**Filed Mar. 12, 1982, Ser. No. 357,756**
**Int. Cl.³ B01F 3/04**
**U.S. Cl. 261—106** **10 Claims**

1. An improved cooling pad support assembly including a gutter positioned below the cooling cells along a bottom stringer in an opening within the wall of the building, at least one cooling cell, a water conductor provided with a plurality of openings therealong and positioned above the cooling cells along a top stringer in an opening within the wall of the building, a top cover over the water conductor, and a conduit connecting the gutter to the top cover, the improvement comprising:

a plurality of gutter supports having a first horizontal flange extending in a direction away from the wall and positioned continuously along the bottom stringer, a plurality of gutter sections connected to the plurality of gutter supports and having a second horizontal flange extending in a direction toward the wall, a plurality of gutter connectors lining the plurality of gutter sections, the bottom of the cooling pads resting on the first and second horizontal flanges of the plurality of gutter supports and gutter sections; and

a plurality of top cover supports, a plurality of water conductor support brackets positioned in spaced relationship



along the plurality of top cover supports, a plurality of top covers connected to the plurality of top cover supports to form a continuous wall above the water conductor, and a plurality of top cover connectors lining the plurality of top covers and positioned immediately above the water conductor, the vertical walls of the top cover supports and the top covers terminating at an angle in downwardly extending flanges that are spaced apart from each other a distance corresponding to the distance between the faces of the cells such that the top portions of the cells are held securely between the downwardly extending flanges.

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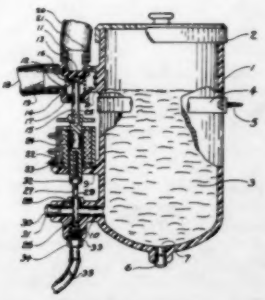
## 4,389,353
## HUMIDIFYING SYSTEM FOR MOBILE VEHICLES

**James T. Gates, 1611 Kirkley Rd., Columbus, Ohio 43221**

**Division of Ser. No. 258,642, Apr. 29, 1981, Pat. No. 4,346,048. This application Jul. 2, 1982, Ser. No. 394,519**
**Int. Cl.³ B60H 3/02**
**U.S. Cl. 261—130** **10 Claims**



1. Apparatus for controlling the humidity of the passenger compartment of a vehicle, in combination:

a container for holding water, said container including an

upper opening for filling purposes and two lower openings for discharge purposes,

when in operative condition:

(a) the upper opening being closed by a lid which seals the container in fluid tight condition,

(b) the first of said lower openings being a drain opening having means therein to prevent both water from discharging and air from entering, and

(c) the second of said lower openings leading into a passage,

said passage including a valve seat, a valve member for sealing against said seat in fluid tight arrangement, said valve member being mounted on a common stem with a reciprocal plunger, said plunger being a part of an actuator,

said actuator being controlled by a humidity sensing device and powered by electrical current from the electrical system of said vehicle,

a hose member leading from the passage downstream of the valve seat to a port into a heating vessel

the passage, hose, port and heating vessel being configured to allow water to flow by gravity from the container to the vessel and air to flow from said vessel to the container to relieve the vacuum formed by the discharge of water from the fluid tight container when said valve member is in open position,

a vapor outlet tube leading from the vessel to the interior of the passenger compartment whereby water vapor generated by said heater will exit the vessel and flow to the compartment until the humidity sensing device deactivates the electrical system when a predetermined humidity level has been reached in the compartment.

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**4,389,354**

## HEATER FOR DEICING CARBURETORS

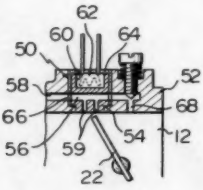
**Haruo Endou, Ashigarakami, and Masao Ishizuka, Odawara, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 23, 1981, Ser. No. 324,029**

**Claims priority, application Japan, Dec. 1, 1980, 55-170962[U]**

**Int. Cl.³ F02M *17/50***

**U.S. Cl. 261—142** **8 Claims**




1. In a carburetor for an internal combustion engine including a housing with an intake passage, a throttle valve in said intake passage, a pilot fuel passage communicating with a fuel chamber and a by-pass port or ports branching from said pilot fuel passage and opening to said intake passage at a location adjacent said throttle valve, the improvement comprising electrical heating means disposed in said housing, said electrical heating means comprising:

a by-pass block mounted in said housing, the by-pass port or ports being formed in said by-pass block and the pilot fuel passage running through said by-pass block;

a heating element disposed within said by-pass block adjacent the by-pass port or ports; and

heat-insulating material in intimate contact with and surrounding said heating element except for the surface of said heating element facing the by-pass port or ports, said surface being free from contact with said heat insulating material.

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**4,389,355**

## SINTERING $UO_2$ AND OXIDATION OF $UO_2$ WITH MICROWAVE RADIATION

**Thomas A. Thornton, and Veldon D. Holaday, Jr., both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Jul. 23, 1981, Ser. No. 286,403**

**Int. Cl.³ G21C *21/00***

**U.S. Cl. 264—0.5** **15 Claims**

1. A method for preparing nuclear fuel pellets comprising the steps of:

(a) blending a predetermined quantity of uranium dioxide and organic binder powders;

(b) shaping and pressing the blended mixture into pressed pellet compacts;

(c) heating and sintering the compacts in a microwave induction furnace in a reducing atmosphere;

(d) holding the compacts at the sintering temperature in the reducing atmosphere for a predetermined time;

(e) cooling the compacts to approximately room temperature while maintaining the reducing atmosphere; and

(f) grinding the compacts to the desired finished pellet product.

11. The method according to claim 1 further including the step of adding a predetermined quantity of $U_3O_8$ powder for blending with said uranium dioxide and organic binder powders of step (a).

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**4,389,356**

## SULFUR PRILLING

**John T. Higgins, Ladysmith, Canada, assignor to Cominco Ltd., Vancouver, Canada**

**Continuation-in-part of Ser. No. 283,319, Jul. 13, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 388,394**

**Claims priority, application Canada, Apr. 29, 1982, 381261**

**Int. Cl.³ B01J *2/04***

**U.S. Cl. 264—9** **19 Claims**

1. A process for the manufacture of particulate sulfur wherein molten sulfur is fed to spray means from which said molten sulfur emanates as a spray of molten sulfur, and said spray is formed into particulate solid sulfur, said process comprising feeding molten sulfur to said spray means at a temperature at least one Celcius degree above the melting temperature of sulfur, said spray means having at least one orifice; forming a spray of molten sulfur at said orifice; vibrating said spray means at a frequency in the range of about 0.2 to 30 cycles per second; forming said spray of molten sulfur into hard spherical particulate sulfur in a current of cooling gas; and recovering said particulate sulfur, whereby the flow of molten sulfur through the orifice is maintained at a uniform, steady rate of flow.

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**4,389,357**

## METHOD FOR PREPARING THERMOSETTING RESINS

**Richard S. Chu, Worthington, and Maher I. Mansour, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.**

**Filed Jun. 26, 1981, Ser. No. 277,724**

**Int. Cl.³ B28B *11/16***

**U.S. Cl. 264—40.1** **4 Claims**

1. The method of preparing a thermosetting resin for subsequent molding operations comprising the steps of,

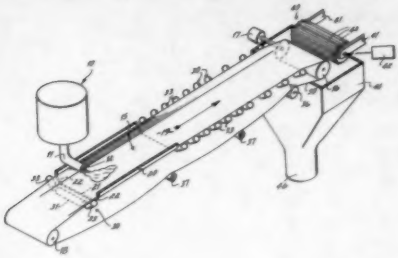
pouring a partially reacted batch of resin onto a continuously moving belt,

driving said belt at a lineal speed in relation to the speed of the pour to create a layer of resin on said belt which is approximately 2 to 4 inches thick, the layer being thin enough to permit said resin to cool reasonably rapidly to stop the thermosetting reaction well short of completion,

stopping said belt after said complete batch of resin has been

poured onto it until said batch has cooled to approximately room temperature,

restarting said belt after said batch has cooled and solidified,



and chopping said solidified batch into chunks at the downstream end of said conveyor.

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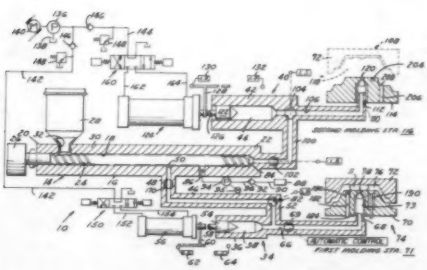
**4,389,358**

## METHOD AND APPARATUS FOR MAKING AN INTEGRAL STRUCTURAL CELLULAR AND NON-CELLULAR PLASTIC OR RESINOUS ARTICLE WITH A SMOOTH OUTER SURFACE

**James W. Hendry, East Detroit, Mich., assignor to KMMCO Structural Foam, Inc., East Detroit, Mich.**

**Filed Jun. 22, 1981, Ser. No. 276,443**
**Int. Cl.³ B29D *27/00*; B29F *1/05, 1/10***
**U.S. Cl. 264—45.1** **18 Claims**



**1.** A method of making a composite structural homogeneous foam resinous or plastic article having (a) a small, dense, homogeneous or non-cellular relatively thin injection compression molded plastic liner on the outer surface and formed in a mold assembly at a first molding station and (b) a foam or cellular relatively thicker injection molded inner plastic structure or core formed in a mold assembly supporting the outer plastic liner at a second molding station and formed integral with said liner to complete the plastic article comprising the steps of:

(a) transferring a homogeneous or non-cellular resinous or plastic material from a plasticating extruder means into a first injection chamber;

(b) transferring a foamable cellular resinous or plastic material from a plasticating extruder means into a second injection chamber;

(c) establishing communication by a passageway having a first valve between said first injection chamber and a first mold assembly having a movable upper mold part and a stationary lower mold part forming the first cavity at a first molding station; said movable upper mold part being adapted to open the mold assembly and form a gap opening therebetween;

(d) opening said first valve and injecting the non-cellular plastic material into the first cavity of the first mold assembly when the gap opening is provided therein;

(e) applying a compressive force to the first mold assembly at said first molding station to close the gap opening of said first mold assembly and to distribute the non-cellular plastic material uniformly throughout said first cavity to form the non-cellular relatively thin outer molded plastic liner;

(f) transferring the movable upper mold part carrying the formed non-cellular relatively thin outer molded liner to a second molding station where the aforesaid upper mold part forms with another stationary lower mold part a second mold assembly which is closed and having a second mold cavity therein which contains in the upper part thereof the previously molded liner;

(g) establishing communication by a passageway having a second valve between said second injection chamber and the second mold cavity at the second molding station;

(h) opening said second valve; and

(i) injecting the foamable cellular plastic material from said second injection chamber into said second mold cavity to distribute the foamable cellular plastic material throughout said second mold cavity to form the cellular relatively thicker inner structure provided with said non-cellular plastic liner on the outer surface of the plastic article.

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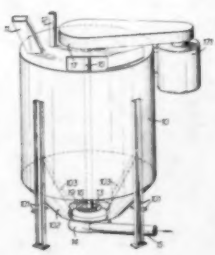
**4,389,359**

## METHODS OF MAKING ASBESTOS-FREE, GLASS FIBRE REINFORCED, CEMENT COMPOSITE PRODUCTS AND THE PRODUCTS OF SUCH METHODS

**William H. Brunt, Manchester, and Kenneth C. Thatcher, Wigan, both of England, assignors to Tegral Technology Limited, Dublin, Ireland**

**Filed Mar. 17, 1981, Ser. No. 244,579**
**Claims priority, application Ireland, Mar. 18, 1980, 552/80**
**Int. Cl.³ C04B *35/58***
**U.S. Cl. 264—69** **18 Claims**



**1.** A method of making an asbestos-free, fiber reinforced, cement composite product using a Magnani-type asbestos-cement machine wherein a fiber-cement slurry is deposited from a reservoir by a slurry distributor onto a water-permeable web, water is drained from the slurry through the web and thereafter the composite product is cured, the improvements which comprise

(a) substituting glass fiber for the asbestos;

(b) mixing cement and water to form a fiber free flowable slurry in a high shear mixing apparatus;

(c) mixing said fiber free flowable slurry with glass fiber by feeding the fiber onto an exposed surface of the slurry as the slurry flows along a conduit and then changing the flow path of the slurry so that said exposed surface becomes covered by a substantial depth of slurry whereby the glass fiber is incorporated into the slurry and completely surrounded by the slurry; and

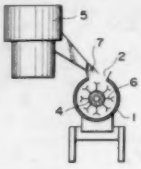
(d) feeding the slurry from step (c) to a reservoir from which it is delivered to the slurry distributor.

4,389,360

## METHOD OF FORMING A PROTECTIVE COATING ON A LONG LANCE TO BE IMMERSED IN MOLTEN METAL

Katsuhiko Noro; Yusei Nagaki; Shinpei Sasaki, all of Tokai, and Sakae Kumagai, Chita, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Yoshikawa Kogyo Co., Ltd., Fukuoka, both of, Japan

Filed Dec. 10, 1980, Ser. No. 215,038
Claims priority, application Japan, Dec. 15, 1979, 54-162992
Int. Cl.³ B28B 1/08
U.S. Cl. 264—71 6 Claims




1. A method of forming a protective coating on a long lance adapted to be immersed in molten metal, said method comprising the steps of:

providing a long lance having extending therefrom, around the area thereof to be coated, reinforcing members comprising studs, metal gauze or reinforcing bars;

providing an annular mold having in a peripheral portion thereof at least one inlet port having a width greater then the outer diameter of said long lance;

positioning said annular mold on its side so that said inlet port faces upwardly;

positioning said long lance in said annular mold such that there is provided between said mold and said lance a clearance that corresponds to the required thickness of the coating to be formed, with said reinforcing members extending into said clearance;

providing a flowable coating material made of a blend of a castable refractory and of heat-resistant metal fibers and aggregates as reinforcing materials;

casting said flowable coating material through said clearance, while avoiding substantial downward settling of said reinforcing material, and thereby forming on said lance a substantially uniformly dense coating of said coating material; and

solidifying and drying said coating.

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4,389,361

## PROCESS FOR MOLDING FIBER LOADED RUBBER COMPOUND

James W. Messerly, Stow, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 206,519, Nov. 13, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,764
Int. Cl.³ D04H 3/16
U.S. Cl. 264—108 11 Claims

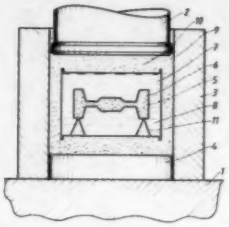
1. A process for the molding of a fiber loaded rubber compound comprising the steps of introducing chopped fibers having lengths with a range which averages between one and two inches into a rubber compound, milling said fibers and rubber compound to break up said fibers during milling to a length that ranges between 0.3 and 0.0625 inches while orientating said fibers in a longitudinal direction to form a fiber loaded rubber compound, placing said fiber loaded rubber compound into a mold, molding said fiber loaded compound in said mold to a desired shape, and removing said molded fiber loaded compound from said mold.

4,389,362

## METHOD FOR MANUFACTURING BILLETS OF COMPLICATED SHAPE

Hans-Gunnar Larsson, Västeras, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Apr. 22, 1981, Ser. No. 256,521
Claims priority, application Sweden, Apr. 25, 1980, 8003138
Int. Cl.³ B22F 1/00
U.S. Cl. 264—111 9 Claims




1. A method for manufacturing a metal billet from a metal powder charge which includes the steps of enclosing the metal powder charge in a first compressible metal capsule, placing the first capsule containing the metal powder charge in a second compressible capsule, filling the space between the first capsule and the second capsule with a pressure-transmitting medium which will become viscous at a certain compacting temperature which is at least equal to the bonding temperature of the powder charge, heating the second capsule and its contents at least to said compacting temperature, placing the so-heated second capsule in a press chamber, surrounding the second capsule while in the press chamber with a readily deformable thermally insulating substance in powder form, and inserting a piston into the press chamber to generate a compacting pressure therein to produce compression of the second capsule and a compression of the first capsule and thus effect a bonding and compaction of the powder charge in the first capsule to provide the desired billet.

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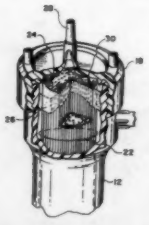
4,389,363

## METHOD OF POTTING MICROPOROUS HOLLOW FIBER BUNDLES

Susan C. Molthop, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 3, 1980, Ser. No. 203,304
Int. Cl.³ B22D 11/126
U.S. Cl. 264—135 20 Claims




1. The method of potting the ends of capillary tubing having microporous walls, which comprises impregnating the ends of said tubing with a curable, fluid sealant, curing said sealant, and thereafter transversely cutting through the sealant-impregnated ends of said tubing to expose an open bore of said tubing

surrounded on its exterior by cured sealant, the improvement comprising, in combination:

prior to impregnating said tubing ends in sealant, filling the micropores in the walls of said tubing with a liquid capable of entering said micropores, whereby air in the bore of said tubing cannot migrate outwardly through said micropores in the walls as the sealant impregnates the tubing ends.

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**4,389,364**

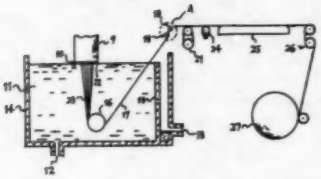
## METHOD OF MAKING THICK-AND-THIN FIBERS

**Tadakazu Endo, and Shigemitsu Saitoh, both of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Division of Ser. No. 100,974, Dec. 6, 1979, Pat. No. 4,340,631. This application Jul. 20, 1981, Ser. No. 284,829**

**Int. Cl.³ D01D** *5/20*

**U.S. Cl. 264—167** **6 Claims**



1. In a method for producing thick-and-thin fibers having a thick-and-thin ratio of 4 to 50, defined as the ratio of the cross-sectioned area of the thick portion to that of the adjacent thin portion and having a fineness which changes gradually and periodically along the longitudinal direction thereof, the steps which comprise:

(1) continuously extruding molten fiber forming polymer through spinneret holes at a constant throughput;

(2) running the extruded filaments through a gap, the length of which is in the range of 0.1 to 6 millimeters and plunging said filaments into a liquid for solidification or coagulation thereof;

(3) vibrating the solidified or coagulated undrawn filaments with a vibrating guide such that the vibrating frequency applied to the filaments is in the range of 100 to 10,000 cycles per minute and thereafter withdrawing them at a constant speed, and

(4) drawing the undrawn filaments to produce a drawn thick-and-thin yarn.

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**4,389,365**

## METHOD AND APPARATUS FOR STRIPPING MOLDED ROUND ARTICLES FROM MOLD

**Peter Kudriavetz, Mattapoisett, Mass., assignor to Acushnet Company, New Bedford, Mass.**

**Filed Dec. 17, 1980, Ser. No. 217,522**

**Int. Cl.³ B29C** *7/00*

**U.S. Cl. 264—297.8** **11 Claims**

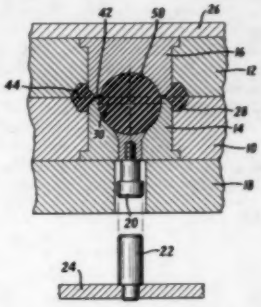
1. A method of molding objects having a curved outer surface comprising:

(a) forming said object in a mold device, said mold device comprising a first set of half molds positioned in a first mold plate and a second set of half molds positioned in a second mold plate, each said half mold in said first set having a cavity therein and each said half mold in said second set having a corresponding cavity which when placed together define the shape of said object and a mold parting line between the cavities, the cavity in each half mold of said first set having a cross-section at the mold parting line whose dimension is from about 0.5% to about 10% less than the dimension of the greatest cross-section of the object to be molded and forming thereby an undercut opening of said cavity,

(b) separating said first mold plate from said second mold plate whereby each molded object is retained in the first set of half molds by the undercut opening thereof;

(c) mechanically removing said molded object from said first set of half molds.

11. A mold device for the production of objects having curved outer surface, said mold device comprising a first set of lower half molds positioned in a first mold plate and a second set of half molds positioned in a second mold plate, each said



half mold having a cavity therein, the cavity of the corresponding half molds, when together, defining the shape of the object, the cavity in each half mold of said first set having a cross-section at the mold parting line of the mold halves whose dimension is in the range of approximately 0.5% to approximately 10% less than the dimension of the greatest cross-section of the object to be molded whereby upon separation of the mold plates the molded object will be retained in said first set of half molds by the undercut opening thereof, and said device further comprising means for mechanically removing each said object from each half mold of said first set.

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**4,389,366**

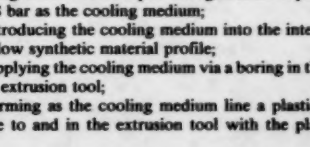
## PROCESS AND DEVICE FOR COOLING HOLLOW SYNTHETIC MATERIAL PROFILES

**Gerhard V. Hoesslin, Düsseldorf, and Jurgen Hesse, Schorndorf, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany**

**Filed Sep. 10, 1981, Ser. No. 300,935**

**Int. Cl.³ B29F** *3/08*

**U.S. Cl. 264—558** **7 Claims**



1. In a process for cooling hollow synthetic material profiles during extrusion by means of direct heat exchange with a cooling medium wherein the profiles are of small cross section, the process including the steps of

(a) using under-cooled liquid nitrogen under a pressure of 2 to 8 bar as the cooling medium;

(b) introducing the cooling medium into the interior of the hollow synthetic material profile;

(c) supplying the cooling medium via a boring in the arbor of the extrusion tool;

(d) forming as the cooling medium line a plastic capillary tube to and in the extrusion tool with the plastic being

selected from the group consisting of polyimide and PTFE and with the capillary tube having a maximum inside diameter of 1.2 mm; and

(e) enclosing the capillary tube in the insulation tube having a maximum outside diameter of 3 mm with the insulation tube outside diameter being of generally the same dimension as the arbor boring.

2. In an extrusion installation for extruding hollow synthetic profiles wherein the profiles are formed by an extrusion tube having an arbor and the profiles are of small cross section, a device for cooling the profiles during extrusion by means of direct heat exchange with a cooling medium, said device including a boring extending longitudinally through said arbor, an insulation tube having a maximum outside diameter of 3 mm being in said boring, said insulation tube outside diameter being of generally the same dimension as said boring, a capillary tube in said insulation tube and being open into the hollow interior of the profile, said capillary tube being made of a plastic material selected from the group consisting of polyimide and PTFE and having a maximum inside diameter of 1.2 mm, and means for supplying under-cooled liquid nitrogen into said capillary tube under a pressure of 2 to 8 bar.

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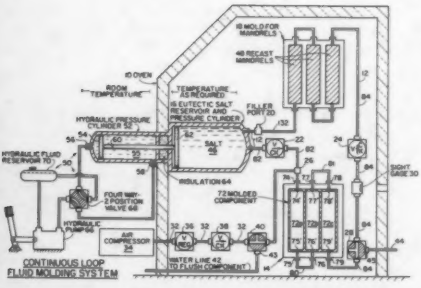
**4,389,367**

## FLUID MOLDING SYSTEM

**Gordon F. Hudson, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Sep. 30, 1981, Ser. No. 306,948**
**Int. Cl.³ B29C *1/06***
**U.S. Cl. 264—570** **31 Claims**




1. An apparatus for forming components, each such component having one or more inner cavities, said apparatus comprising:

a molding fixture in which the component is contained during formation, said molding fixture having a fluid inlet port so arranged that, with the component contained in the molding fixture, each inner cavity of the component is in fluid communication with the fluid inlet port;

a reservoir in fluid communication with the fluid inlet port; and

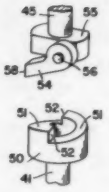
a quantity of eutectic salt partly contained in the reservoir and partly contained in the molding fixture in the form of a number of mandrels about which material forming the component is laid up, the number of mandrels being equal to the number of inner cavities in the component, said eutectic salt existing in either a solid or a molten state depending on its temperature, said eutectic salt in its molten state exhibiting, when compressed, a uniform hydraulic pressure over its containing surface.

**4,389,368**

## FAILSAFE COOLANT PUMP FOR NUCLEAR REACTOR

**Richard J. Duncan, 20800 Homestead Rd., Apt. 3C, Cupertino, Calif. 95014**

**Filed Aug. 15, 1980, Ser. No. 177,994**
**Int. Cl.³ G21C *9/00***
**U.S. Cl. 376—283** **4 Claims**




1. In a pressurized fluid nuclear reactor system having a fluid cooled reactor core contained within a reactor vessel, means for delivering the fluid coolant to the reactor core including a centrifugal type coolant pump having a housing and a shaft projecting from said housing, said shaft driven by a drive shaft in vertical end-to-end coaxial relation and means for removing the fluid coolant from the reactor core including a steam generator, said coolant pump delivering coolant from said steam generator to said reactor core and back to said steam generator in a continuous cycle, the improvement consisting a unidirectional drive means in the form of a ratchet means acting along the coaxial axes of said pump shaft and said drive shaft in a plane interposed between the ends of said pump shaft and said drive shaft and exterior of said pump housing enabling said coolant pump to operate at a greater rotational speed than said drive shaft in the pumping direction only said ratchet means comprising a ratchet block rigidly fixed on the end of one of said drive shaft and said pump shaft with a ratchet tooth projecting toward the end of the other of said drive shaft and said pump shaft, a ratchet arm mounting block rigidly fixed on the end of the other of said drive shaft and said pump shaft, a ratchet arm engaging said ratchet tooth upon relative rotation of said drive shaft with respect to said pump shaft in the pumping direction only, and means mounting said ratchet arm on said ratchet mounting block for movement only along said coaxial axes of said drive shaft and said pump shaft.

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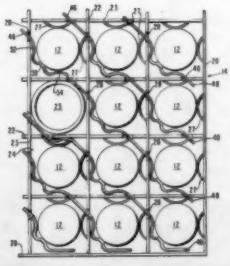
**4,389,369**

## BI-METALLIC GRID FOR A NUCLEAR REACTOR FUEL ASSEMBLY

**William J. Bryan, Penn Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 11, 1980, Ser. No. 176,626**
**Int. Cl.³ G21C *3/34***
**U.S. Cl. 376—442** **5 Claims**



1. An assembled grid for holding fuel rods and control rod

guide tubes in spaced relationship with each other in a nuclear reactor fuel assembly comprising:

a first set of straps interleaved at right angles to each other to form multiple openings of square configuration;

a second set of straps interleaved at right angles to each other to form multiple openings of square configuration and of a size the same as the openings formed by the first set of straps;

said second set of straps being mounted on top the first set of straps in a manner wherein the openings in each of said sets are in axial alignment with each other to form multiple cells;

a pair of dimples projecting inwardly into a predetermined number of said cells adapted to receive nuclear fuel rods therein from the cell walls formed by two adjacent straps in the first and second strap sets, thus providing two sets of vertically aligned dimples in each cell; the other two walls of said predetermined number of cells other than those cells on the periphery of said grid each having a slot therein at a location spaced from the corners of each said cell;

a peripheral strap surrounding said top and bottom sets of straps, the ends of said interleaved straps being bonded to the peripheral strap to thus hold the top and bottom strap sets in immovable relationship with respect to each other;

multiple spring means extending across said cells from one side of the assembled grid to the other, each of said spring means being unitary and extending through a plurality of generally diagonally aligned contiguous cells through said slots in said other two walls and having a segment which biases a fuel rod adapted to extend through each of said predetermined number of cells into engagement with said dimples to provide at least five points of support to said fuel rod.

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**4,389,370**

## LOW GOLD CONTENT DENTAL ALLOY

**Nicholas J. Skalabrin, 1004 Puget Dr., SE., Port Orchard, Wash. 98366**

**Filed May 6, 1981, Ser. No. 261,000**
**Int. Cl.³ C22C *5/06***
**U.S. Cl. 420—505** **1 Claim**

1. An alloy especially designed to be used for inlays, onlays, ¾ crowns and bridges, wherein by weight the Gold content is 10%, the Palladium 22%, the Silver 59%, the Tin 8%, and the Zinc 1%.

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**4,389,371**

## PROCESS FOR INHIBITING THE CORROSION OF ALUMINUM

**Joe C. Wilson, Woodhaven; Stephen E. Eisenstein, Oak Park; Jerrold F. Maxwell, Trenton, and Stanley T. Hirozawa, Birmingham, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

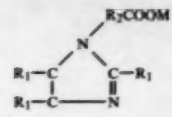
**Continuation of Ser. No. 75,689, Sep. 14, 1979, abandoned. This application Jul. 8, 1981, Ser. No. 281,516**
**Int. Cl.³ C23F *11/14, 11/16, 11/18***
**U.S. Cl. 422—15** **4 Claims**

1. A process for inhibiting the corrosion of aluminum in contact with aqueous liquids, excluding alkali metal nitrates and nitrites, said process comprising adding to said liquid an effective amount of

(A) a conventional corrosion inhibitor selected from the group consisting of at least one of the alkali metal carbonates, borax, the alkali metal dichromates, the alkali metal silicates, phosphorus acid, phosphoric acid, an alkali metal tungstate, an alkali metal salt of benzoic or toluic acid, an alkali metal salt of a phenol, benzotriazole, tolyltriazole, an alkanolamine, and an organo-silicone compound;

(B) about 0.5 percent to about 15 percent by weight of an alkanolamine phosphate; and

(C) about 0.03 percent to about 2 percent by weight of a heterocyclic nitrogen compound having the formula:



wherein $R_1$ is individually selected from hydrogen or a monovalent radical selected from the group consisting of straight or branched chain monovalent alkyl of 1 to 18 carbon atoms, monovalent cycloalkyl or alkoxy radical having up to 18 carbon atoms, a monovalent alkylene radical of 1 to 18 carbon atoms, monovalent aryl radical, a monovalent alkylaryl having 1 to 18 carbon atoms in the alkyl portion thereof, or wherein each $R_1$ is combined into a single divalent alkyl radical having 2 to 18 carbon atoms; and wherein $R_2$ is a divalent radical selected from the group consisting of at least one of an alkyl radical or an alkoxy radical each having 2 to 18 carbon atoms and wherein said alkoxy radical is derived from an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, tetrahydrofuran, and mixtures thereof; and wherein M is an alkali metal.

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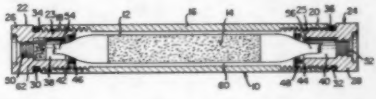
**4,389,372**

## PORTABLE HOLDER ASSEMBLY FOR GAS DETECTION TUBE

**Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470**

**Filed Jul. 13, 1981, Ser. No. 282,436**
**Int. Cl.³ G01N *1/22*; B01L *9/00***
**U.S. Cl. 422—88** **8 Claims**



1. In combination, a portable gas detection tube holder assembly and at least a first and second gas detection tube supported by said holder assembly in a series or parallel arrangement relative to one another with each gas detection tube having an elongated body within which a chemical sorbent material is stored, a tapered neck portion at opposite ends of said elongated body and an opening in each neck portion adapted for drawing ambient gas through said sorbent material, said gas detection tube holder assembly comprising:

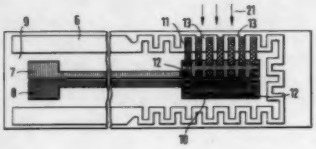
a clear hollow tubular shell surrounding each gas detection tube in a spaced apart relationship with each shell having opposite open ends;

end fitting means for closing the open ends of each shell to form a closed chamber between each shell and each gas detection tube with each end fitting means having a longitudinal bore for communicating with the opening in each neck portion of each gas detection tube; means for coupling in series or parallel arrangement said first and second gas detection tubes and said respective tubular shells to one another through an end fitting means for each gas detection tube such that said first gas detection tube has one open neck portion communicating with one open neck portion in said second gas detection tube; and an O-ring mounted in each end fitting means in surrounding engagement about the tapered neck portion of each gas detection tube at each opposite end thereof such that each gas detection tube is suspended between a pair of O-rings in longitudinal alignment with the longitudinal bore of the end fitting means and for sealing off the open ends of each gas detection tube from the surrounding closed chamber.

## 4,389,373
## HEATED ION CURRENT SENSOR FOR HIGH TEMPERATURES

**Ernst Linder, Mühlacker; Klaus Müller, Tamm, and Helmut Maurer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 9, 1980, Ser. No. 214,718**
**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005928**
**Int. Cl.³ G01N *27/12***
**U.S. Cl. 422—98** **10 Claims**



1. Sensor for detecting ion currents in mixtures of hydrocarbon substances comprising

an essentially rectangular substrate plate (1) having a major axis and a minor axis, said plate having an insulated surface;

two layer-like electrodes (3, 4; 7, 8; 16, 17) located on one major surface of the substrate plate inwardly of marginal regions of the substrate plate, along the major axis, spaced from each other, and having a measuring region on a portion thereof;

a heater (2, 6, 15) located adjacent the electrodes to heat at least the measuring region;

and gas flow guide means (11, 12; 18) comprising ridges projecting from the major surface of the substrate and leading from a marginal region thereof in the direction along the minor axis towards the measuring region of the electrodes to guide gas, the ionization of which is to be measured, to the measuring region of said electrodes.

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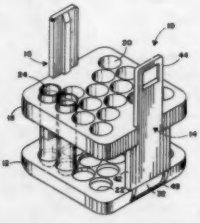
## 4,389,374
## CENTRIFUGE TUBE HOLDER

**John H. Sutton, Belmont, and Rebecca J. Woodruff, Fremont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Jun. 29, 1981, Ser. No. 278,772**
**Int. Cl.³ B01L *9/06***
**U.S. Cl. 422—104** **1 Claim**



1. A centrifuge tube holder assembly comprising:

a base having a specified perimeter;

a top having a perimeter the same shape and size as said specified perimeter of said base;

a pair of side panels detachably connected to said base and top to secure and maintain said top and bottom in a spaced apart relationship, each of said side panels having an upwardly extending handle-arm for holding or securing said assembly;

a tongue section on opposite sides of said base and a loop on the bottom of each of said pair of side panels, said loops of said pair of side panels receiving said tongue sections of said base, said tongue sections being recessed within said base, said side panels being within said specified perimeter when attached to said base;

at least two connecting pins on each of said pair of side panels and at least two holes on said top for receipt of said connecting pins for securing said top to said side panels, said top having slots to receive said side panels, said side panels being within said perimeter of said top when attached to said top, said tongue sections and said slots acting cooperatively with said side panels so that said specified perimeter is not enlarged by the attachment of said side panels to said base and said top; and

means in said top and base for locating and positioning centrifuge tubes.

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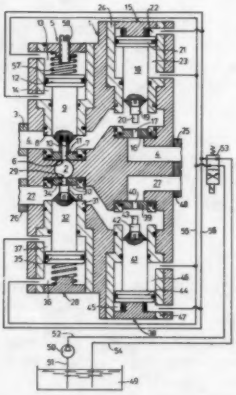
## 4,389,375
## APPARATUS FOR PRODUCING A REACTION MIXTURE OF FLUID COMPONENTS FORMING A FOAM OR SOLID MATERIAL

**Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Königswinter; Reiner Raffel, Siegburg, and Ferdinand Althausen, Neunkirchen-Seelscheid, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany**

**Filed May 11, 1981, Ser. No. 262,017**
**Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020203**
**Int. Cl.³ B01J *14/00***
**U.S. Cl. 422—111** **4 Claims**



1. An apparatus for producing a reaction mixture of fluid components forming a solid or foam material and optionally containing filler, the apparatus comprising:

storage vessels for the components, feed pipes which connect the storage vessels via metering pumps to a mixing chamber arranged in a mixing head into which said feed pipes open via injectors; an outlet opening arranged in the mixing chamber; and return pipes with associated shut-off members; the injectors and the shut-off members being in the form of nozzles comprising needles which cooperate with replaceable nozzle seats containing the nozzle orifices; a separate hydraulic positive control piston and chamber being associated with each nozzle, control means, associated with each of said pistons and chambers, adapted to provide that all the nozzles are closed for a short time interval during the changeover from mixing

condition to fluid circulation condition and from fluid circulation condition to a mixing condition, wherein

the needles of the nozzles comprise control pins which are designed to sealingly engage the nozzle orifices, the control pins never traveling more than a distance equal to the length of the nozzle orifices back from the nozzle orifices when the nozzles are open, and the nozzles are designed to be simultaneously operated.

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**4,389,376**

## APPARATUS FOR THE PREPARATION OF SLAKED LIME SOLUTION

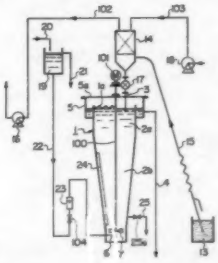
**Sadao Kojima, 4-27-4, Mejirodai Hachioji-shi, Tokyo; Masaaki Shimada, 15-1, Sanuka-machi 2-chome, Iwaki-shi, Fukushima-ken; Kunio Sakai, 4-1, Sagiuchi, Nishiki-machi, Iwaki-shi, Fukushima-ken, and Katuo Horie, 59, Odakatakamatsu, Nakoso-machi Iwaki-shi, Fukushima-ken, all of Japan**

**Division of Ser. No. 134,051, Mar. 26, 1980. This application Jan. 8, 1981, Ser. No. 223,286**

**Claims priority, application Japan, Mar. 28, 1979, 54-36614; Sep. 21, 1979, 54-121665; Nov. 1, 1979, 54-141888; Nov., 1979, 54-141889; Nov. 1, 1979, 54-141890**

**Int. Cl.³ B01F *7/18***

**U.S. Cl. 422—228** **7 Claims**



1. An apparatus for the preparation of a clear substantially saturated calcium hydroxide solution from slaked lime and water comprising:

a vessel having a lower portion formed by an inverted truncated cone having a closed bottom which defines a bottom of the vessel;

an upper portion formed by a cylinder having a bottom connected to a top of the inverted truncated cone, and having an open top containing a plurality of periodic indentations around the circumferential edge;

means for removing a substantially clear saturated calcium hydroxide solution from the top of the vessel in an overflowing manner over the circumferential edge;

longitudinally extending baffle means positioned axially around the circumference of the inverted truncated cone to cause a slurry in the lower portion to move upwardly in hindered flow without particle entrainment in the upper portion;

inlet means for slaked lime;

inlet means for water positioned in close proximity to the bottom of the vessel, the inlet means directing the flow of water in a downward direction toward the bottom of the vessel; and

means for providing agitation positioned near the bottom of the vessel.

**4,389,377**

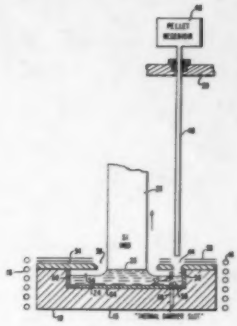
## APPARATUS FOR GROWING A DENDRITIC WEB

**Charles S. Duncan, Pittsburgh; Paul A. Piotrowski, Monroeville; Maria E. Skutch, Trafford, and James P. McHugh, Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 10, 1981, Ser. No. 282,334**

**Int. Cl.³ C30B *15/10***

**U.S. Cl. 422—246** **12 Claims**



1. In a melt system for growing a dendritic web, and the like, comprised of a heated susceptor including a body within which a crucible is mounted, said crucible containing a melt of material from which the web is grown and including means for separating the interior of the crucible into a growth region and a replenishment region, the improvement comprising means in the body of said susceptor providing a region of thermal discontinuity in relatively close proximity to said crucible separating means whereby heat transfer in said susceptor body is modified to provide a non-linear change in temperature gradient between the growth and replenishment regions.

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**4,389,378**

## PROCESS USING SULPHATE REAGENT FOR RECOVERING VANADIUM FROM COKES DERIVED FROM HEAVY OILS

**Lois L. McCorriston, Mississauga, Canada, assignor to Gulf Canada Limited, Toronto, Canada**

**Continuation of Ser. No. 198,502, Oct. 20, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,104**

**Int. Cl.³ C01G *31/00***

**U.S. Cl. 423—68** **4 Claims**

1. A process for the recovery of vanadium from a sulphur-containing material of the group consisting of coke derived from oil and ash obtained from said coke, wherein said hydrocarbonaceous oil is heavy oil, in-situ oil sands bitumen or mineable oil sands bitumen, comprising:

(a) mixing said material with an alkali metal sulphate reagent in a finely divided form,

(b) heating the mixture in the presence of an oxidizing atmosphere at an elevated temperature below the fusion point of the reagent,

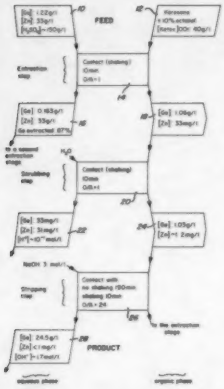
(c) contacting the resulting solid residue with water, thereby forming a leach solution consisting essentially of water and sodium vanadate compounds, and

(d) recovering the vanadium values from the leach solution, the amount of said alkali metal sulphate being sufficient to convert the vanadium values present in said material into alkali metal vanadate and to maintain said leach solution substantially free of reagent.

## 4,389,379
## PROCESS FOR SELECTIVE LIQUID-LIQUID EXTRACTION OF GERMANIUM

Denise Rouillard epouse Bauer, Le Raincy; Gerard Cote, Paris, both of France; Paolo Fossi, Elancourt, Italy, and Bruno Marchon, Paris, France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Filed Aug. 15, 1980, Ser. No. 178,583
Int. Cl.[3] C01G 17/00
U.S. Cl. 423—89 13 Claims




1. A process for selective liquid-liquid extraction of germanium from an aqueous acidic liquor containing, besides germanium, at least one other metal selected from the group consisting of cadmium, cobalt and nickel, said process comprising,

adjusting the pH of said aqueous liquor to a value lower than 2 before extracting germanium from said aqueous liquor,

extracting germanium from said aqueous liquor by contacting said liquor with an organic medium which contains a diluent and an extractant, said diluent being immiscible with said aqueous liquor, said extractant being an oxine derivative having a long hydrocarbon chain containing 8 to 16 carbon atoms, said extracting step forming an aqueous phase containing the major part of said at least one other metal and an organic phase containing the major part of germanium from said aqueous liquor, and

stripping germanium from said organic phase by contacting said phase with an alkaline medium, said stripping step forming an aqueous phase containing the major part of germanium from said aqueous liquor and an organic phase containing said diluent and said extractant.

## 4,389,380
## MULTIPLE-STAGE THERMAL BENEFICIATION PROCESS FOR PHOSPHATE ORES

Kenneth L. Parks, Plant City, Fla., assignor to Agrico Chemical Company, Tulsa, Okla.

Filed Jan. 12, 1982, Ser. No. 338,868
Int. Cl.[3] C01F 1/00, 5/00, 11/00; C01B 25/26
U.S. Cl. 423—167 9 Claims

1. A method for calcining phosphate rock, comprising:

(a) introducing phosphate rock to be calcined into a first stage;

(b) heating said phosphate rock in said first stage in the presence of excess oxygen to a temperature of from about 1140° F. to about 1200° F. to destroy substantial quantities of organic carbon impurities in said phosphate rock but not to produce an undesirable quantity of sulfides;

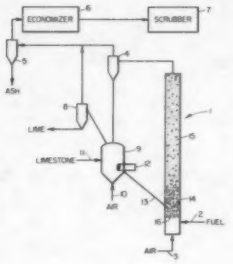
(c) introducing the phosphate rock into a second stage afer it has been heated in said first stage; and

(d) heating said phosphate rock in said second stage in the presence of excess oxygen to a temperature of about 1180° F. to about 1330° F. to destroy most of the remaining organic carbon impurities but without detrimentally diminishing the reactive surface area of the phosphate rock.

## 4,389,381
## LIMESTONE CALCINATION

Salvatore T. Dinovo, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Sep. 19, 1980, Ser. No. 188,932
Int. Cl.[3] C01F 11/06
U.S. Cl. 423—175 4 Claims




1. A method for producing a finely-divided lime powder substantially free of ash from a limestone raw material which comprises

(A) generating heat from the combustion of fuel in a primary, entrained-bed combustor having relatively fine particles entrained in a primary fluidizing gas,

(B) transferring heat of combustion of the fuel to the fine, entrained-bed particles in the combustor,

(C) circulating at least a portion of the heated, fine, entrained-bed particles to an external, secondary fluidized bed,

(D) removing impurities from the portion of heated, fine, entrained-bed particles prior to entry in the secondary fluidized bed,

(E) introducing particulate limestone and a secondary fluidizing gas into the secondary fluidized bed such that the limestone comes into contact with the heated, fine, entrained-bed particles thereby heating the particulate limestone and decomposing it to particulate lime,

(F) recycling the relatively cool, fine, entrained-bed particles from the secondary fluidized bed to the primary entrained-bed combustor, and

(G) recovering the particulate lime from the secondary fluidized bed.

## 4,389,382
## METHOD OF USING A SIMPLIFIED LOW COST CATALYST SYSTEM

Haren S. Gandhi, Farmington Hills, and Karen M. Adams, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

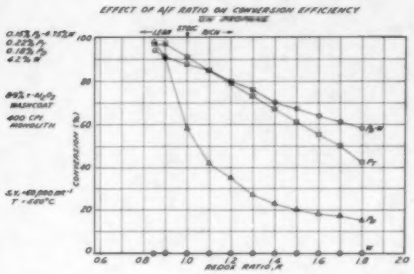
Filed Jul. 20, 1981, Ser. No. 284,763
Int. Cl.[3] B01D 53/36; B01J 23/68
U.S. Cl. 423—213.5 13 Claims

1. In a process for treatment of exhaust gases from an internal combustion engine, the steps of:

burning a hydrocarbon fuel or a fuel containing hydrocarbons and alcohol blends in the internal combustion engine thereby to generate exhaust gases from the internal combustion engine containing various amounts of unburned hydrocarbons, carbon monoxide, and oxides of nitrogen depending upon operating conditions of the internal combustion engine; and

passing said generated exhaust gases over an improved catalyst, comprising:

a support medium for supporting a catalyst system, said support medium having both an upstream support portion over which exhaust gases initially flow and a downstream support portion over which exhaust gases flow




after passing over said upstream support portion thereof;

palladium on said upstream support portion of said support medium; and

tungsten on said downstream support portion of said support medium, said downstream support portion of said support medium being free of palladium.

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**4,389,383**

## REGENERABLE PROCESS FOR THE SELECTIVE REMOVAL OF SULFUR DIOXIDE FROM EFFLUENT GASES

**Joseph E. Sokolik, Jr., Carmel; Alexander J. M. Kosseim, Rye, and Gilbert R. Atwood, Briarcliff Manor, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.**

**Continuation of Ser. No. 153,458, May 27, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,915**

**Int. Cl.³ C01B** *17/00*

**U.S. Cl. 423—243** **5 Claims**

1. In a process for removing sulfur dioxide from a mixture of gases wherein said mixture is contacted in an absorption zone with an amine solvent in aqueous solution to absorb $SO_2$ to form an $SO_2$ rich aqueous amine solution which is then passed to a stripping zone where $SO_2$ is removed from such aqueous amine solution to form a lean aqueous amine solution containing some $SO_2$ and heat stable salts which is recycled to the absorption zone the improvement comprising:

(a) using as the solvent an amine; having a boiling point below about 250° at one atmosphere;

(b) removing a portion of said lean aqueous amine being recycled to said absorption zone and passing said portion to a reaction zone;

(c) admixing said portion of lean aqueous amine with at least one alkali or alkaline earth oxide, hydroxide or carbonate in an amount such that at least one equivalent of metal cation is added per one equivalent of sulfur oxy anions present in said lean aqueous amine solution to form a heat stable solid precipitant;

(d) passing said reacted mixture to a separation zone which is at a temperature of less than about 140° C. and at a pressure less than 250 mmHg, and maintaining said mixture at said temperature and pressure, removing as an overhead vapor phase a solution containing mainly all water and amine which is recycled back to said absorption zone and collecting a solid bottom residue comprising essentially all sulfur oxy anion salts.

**4,389,384**

## PROCESS FOR REDUCING PHOSPHATE ORE

**Robert A. Hard, Laguna Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.**

**Filed May 10, 1982, Ser. No. 376,335**

**Int. Cl.³ C01B** *25/12, 25/16, 25/01, 25/02*

**U.S. Cl. 423—304** **11 Claims**

1. A process for producing phosphorus pentoxide from phosphate ore comprising the steps of:

mixing phosphate ore with silica and solid carbonaceous material in amounts to produce a feed mixture having a $CaO/SiO_2$ mole ratio less than about 0.5;

forming the feed mixture into agglomerated feed particles;

heating the agglomerated feed particles, by exposure to radiation emanating from an oxidation zone to a temperature sufficient to reduce the phosphate in the agglomerated feed particles by reaction with the solid carbonaceous material to form elemental phosphorus vapors without substantial melting of the agglomerated feed particles; and,

providing sufficient oxygen-containing gas to cause oxidation of the elemental phosphorus vapor within the oxidation zone to produce phosphorus pentoxide and to heat the agglomerated feed particles.

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**4,389,385**

## PRODUCTION OF POROUS GELS AND CERAMIC MATERIALS

**John D. F. Ramsay, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Continuation of Ser. No. 733,151, Oct. 18, 1976, abandoned. This application Feb. 1, 1980, Ser. No. 117,766**

**Claims priority, application United Kingdom, Oct. 22, 1975, 43463/75; Jun. 18, 1976, 25497/76**

**Int. Cl.³ C01B** *33/158;* **C01G** *25/02, 23/08;* **C01F** *7/02*

**U.S. Cl. 423—338** **12 Claims**

1. A process for the production of a porous gel of an inorganic substance without hydrothermal treatment to enlarge the pores, which comprises adding solid primary particles of the substance, produced by a vapor phase condensation method, to a quantity of liquid sufficient to form a sol, and dispersing the solid primary particles therein to form a sol containing colloidal particles which are aggregates of the primary particles, and drying the sol to produce a porous gel having a porosity of at least 0.70 and with 70 percent of the pore volume contained within pores having a size in the range of ±25 percent of the mean.

5. A process as claimed in claim 1 wherein the solid primary particles are of alumina, or of silica, or of titania, or of zirconia.

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**4,389,386**

## HNCO MANUFACTURE BY CATALYTIC OXIDATION OF HCN WITH A PD DOPED AG CATALYST

**Yoseph Feit; David R. Kilanowski, both of Stamford, and Kenneth E. Olson, Riverside, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Sep. 24, 1981, Ser. No. 305,058**

**Int. Cl.³ C01C** *3/14*

**U.S. Cl. 423—365** **3 Claims**

1. In the process for the manufacture of isocyanic acid by catalytic oxidation of hydrogen cyanide in the gaseous state at temperatures in the range from about 500° to about 800° C. with at least one-half mole of oxygen per mole of hydrogen cyanide, the improvement in which the catalyst comprises a metallic silver catalyst having palladium at the catalyst surface, in an amount effective to increase the catalytic activity of said catalyst in respect of conversion of said hydrogen cyanide.

**4,389,387**

## METHOD FOR PREPARING CARBON FIBERS

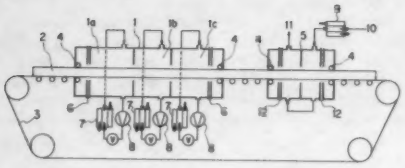
**Tamotsu Miyamori; Hisatsugu Kaji; Iwao Kameyama, all of Iwaki, and Michio Takahashi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 105,130, Dec. 19, 1979, Pat. No. 4,314,981. This application Sep. 18, 1981, Ser. No. 303,624**

**The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.**

**Int. Cl.³ C01B** *31/07*

**U.S. Cl. 423—447.7** **5 Claims**



1. A method for preparing carbon fibers from a pitch, wherein the pitch is spun into pitch fibers, the pitch fibers are treated with an oxidizing gas and the treated fibers are carbonized into the carbon fibers, said method comprising:

introducing the loaded pitch fibers on a net-belt conveyor into a infusibilizing furnace having at least two exposing chambers arranged in series of increasing temperature said exposing chambers having a temperature gradient of 5° to 100° C. per chamber in the direction of from the inlet to the outlet of said infusibilizing furnace;

exposing the introduced pitch fibers to a gaseous mixture of air and a gaseous oxidizing agent by passing said gaseous mixture between said introduced fibers at a temperature lower than the softening point of said pitch fibers by 5° to 50° C., said gaseous mixture is circulated at a velocity represented by the equation (1):

$$U_G \geq 0.023 \left[ \frac{(\rho_B X H) + 10.6}{\theta^{0.7}} \right] \quad (1)$$

wherein $U_G$ represents said velocity of said gaseous mixture in circulation in said infusibilizing furnace and is in a range of not less than 0.1 and not larger than 1.5 Nm/sec, $\rho_B$ represents the packing density of said pitch fibers loaded on said net-belt conveyer and is in a range of not less than 30 and not larger than 300 kg/m$^3$, H represents the packing height of said pitch fibers loaded on said net-belt conveyer and is in a range of not less than 0.02 and not larger than 0.5 m and $\theta$ represents the time period of infusibilization in said infusibilizing furnace and is in a range of not less than 1 and not larger than 4 hours, within said infusibilizing furnace forcibly.

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**4,389,388**

## DESULFURIZATION OF PETROLEUM COKE

**Charles P. Goforth, Tulsa, and John A. Hamshar, III, Owasso, both of Okla., assignors to Cities Service Company, Tulsa, Okla.**

**Filed Feb. 22, 1982, Ser. No. 351,051**

**Int. Cl.³ C01B** *31/02, 17/16;* **C10L** *9/04*

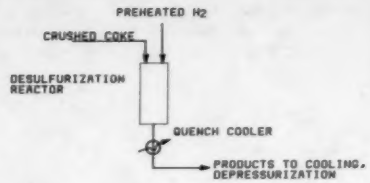
**U.S. Cl. 423—461** **2 Claims**

1. A process for the desulfurization and devolatilization of petroleum coke comprising the serial steps of:

a. grinding the coke,

b. introducing the coke into a reactor,

c. contacting the coke with hydrogen, at a temperature varying from about 700° C. (1290° F.) to about 980° C. (1800° F.) and a hydrogen partial pressure varying from about 300 psig (21 kg/cm$^2$) to about 2000 psig (144 kg/cm$^2$), for a total reactor contact time of less than 60 seconds,




d. cooling the coke, and

e. removing the treated coke.

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**4,389,389**

## PROCESS FOR PREPARATION OF HIGH PURITY TELLURIUM

**Santokh S. Badesha, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 2, 1982, Ser. No. 404,257**

**Int. Cl.³ C01B** *19/02*

**U.S. Cl. 423—510** **20 Claims**

1. A process for the preparation of tellurium of high purity which comprises reacting tellurium dioxides, with a diol, and subjecting the resulting tellurium ester, subsequent to purification, to a reduction reaction.

16. A process for preparing tellurium in high purity which comprises reacting tellurium tetrachloride with an aliphatic alcohol in the presence of an alkoxide, corresponding to the alcohol, and subjecting subsequent to purification the resulting tellurium ester to a reduction reaction.

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**4,389,390**

## PROCESS FOR PRODUCING HYDROGEN PEROXIDE

**Augustine I. Dalton, Jr.; Eugene J. Greskovich, and Ronald W. Skinner, all of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Continuation-in-part of Ser. No. 195,828, Oct. 10, 1980, Pat. No. 4,336,238. This application Jan. 29, 1982, Ser. No. 344,235**

**The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.**

**Int. Cl.³ C01B** *15/02*

**U.S. Cl. 423—584** **14 Claims**

1. In a process for producing hydrogen peroxide by contacting a mixture of gases comprising hydrogen and oxygen with a palladium catalyst supported on a carbon base in a reaction vessel in the presence of an acidic aqueous liquid, containing 70 to 95% by volume of an oxygenated or nitrogenous organic solvent, or methanol containing up to 5% by volume of water, capable of inhibiting the decomposition of thus-produced hydrogen peroxide, the improvement comprising prolonging effective catalyst life by continuously removing from the acidic liquid in the reaction vessel palladium salts produced by solubilization of the palladium catalyst, employing as the carbon catalyst an activated non-graphitic carbon having a surface area above 400 m$^2$/g, which carbon adsorbs palladium salts produced by solubilization of the palladium catalyst.

11. In a process for producing hydrogen peroxide by contacting a mixture of gases comprising hydrogen and oxygen with a palladium catalyst supported on a carbon base in the presence of an acidic aqueous liquid, containing 70 to 95% by volume of an oxygenated or nitrogenous organic solvent, or methanol containing up to 5% by volume of water, capable of inhibiting the decomposition of thus-produced hydrogen peroxide, the improvement comprising prolonging effective catalyst life by continuously removing from the acidic liquid in the reaction vessel palladium salts produced by solubilization of

the palladium catalyst by mixing with the carbon base an anion-exchange resin, capable of removing palladium salts.

13. In a process for producing hydrogen peroxide by contacting a mixture of gases comprising hydrogen and oxygen with a palladium catalyst supported on a carbon base in a reaction vessel in the presence of an acidic liquid capable of inhibiting the decomposition of thus-produced hydrogen peroxide, the improvement comprising prolonging effective catalyst life by continuously removing from the acidic liquid in the reaction vessel palladium salts produced by solubilization of the palladium catalyst, wherein removal of palladium salts is effected by activated nongraphitic carbon, having a surface area above 400 $m^2/g$, external to the reaction vessel in which hydrogen peroxide is prepared and liquid freed of palladium salts is returned to the reaction vessel.

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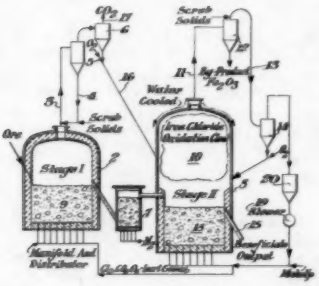
**4,389,391**

## PROCESS FOR BENEFICIATING TITANIFEROUS ORES

**Wendell E. Dunn, Jr., Star Rte. 68D, Lead, S. Dak. 57754**

**Filed Jun. 28, 1981, Ser. No. 278,322**
**Int. Cl.³ C01G *23/047*; C22B *1/00***
**U.S. Cl. 423—610** **8 Claims**




1. In a process for beneficiation of titaniferous ore by chlorination under fluidizing and reducing conditions in the presence of a carbonaceous material at elevated temperatures comprising converting the iron oxide portion of the ore to vaporized iron chloride or a mixture of vaporized iron chlorides and producing carbon dioxide and producing thereby a product comprising essentially polycrystalline rutile:
the improvement consisting of:

(a) chlorinating the ore in a first reactor to form a partially beneficiated ore-carbon mixture and a gaseous by-product comprising carbon dioxide, traces of carbon monoxide, iron chlorides and diluent gases;

(b) condensing the iron chloride in the gaseous by-product and exiting the said carbon dioxide, traces of carbon monoxide, and diluent gases in said gaseous by-product;

(c) passing the condensed iron chlorides and partially beneficiated ore carbon mixture to a second reactor;

(d) subjecting the partially beneficiated ore-carbon mixture to chlorine and at elevated temperatures to further beneficiate said ore forming vaporized iron chloride and vaporizing iron chlorides introduced from the first reactor exiting said further beneficiated ore from the second reactor and thereafter cooling and separating the product from unreacted carbon; and

(e) subjecting the vaporized iron chloride or mixture of iron chlorides and the carbon dioxide to oxygen to oxidize the iron chlorides to chlorine and iron oxide.

6. The process of claim 1 comprising transferring the ore-coke product from Stage II to a third reactor, to form a bed which is contacted, at elevated temperature with recycled chlorine from iron chloride oxidization to form a mixture of $TiCl_4$ and minor amounts of iron chloride and other chlorides separating $TiCl_4$ from the mixture venting carbon dioxide and inert gas oxidizing with the $TiCl_4$ to form $TiO_2$ pigment and chlorine mixed with nitrogen and transferring to chlorine mixed with nitrogen to the first and second reactors.

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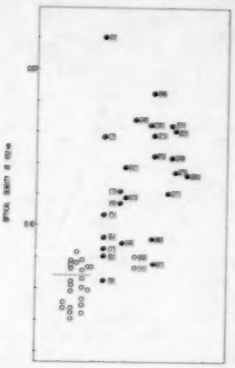
**4,389,392**

## DETERMINATION OF TUMOR ASSOCIATED GLYCOLINKAGE AND DIAGNOSIS OF CANCERS

**Masakazu Adachi, Takasaki, Japan, assignor to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 116,727, Jan. 30, 1980, abandoned. This application Sep. 17, 1980, Ser. No. 187,890**
**Claims priority, application Japan, Jan. 30, 1979, 54/9435; Nov. 1, 1979, 54/141741**
**Int. Cl.³ G01N *33/56, 33/58, 33/60***
**U.S. Cl. 424—1** **26 Claims**



1. A method for determining the level of tumor associated glycolinkage containing substance in a sample of body fluid which comprises reacting the tumor associated glycolinkage containing substance in a sample of the body fluid with a lectin capable of specifically combining with a terminal galactose ($\beta$1→ or $\beta$1→4)-N-acetylglucosamine or -N-acetylgalactosamine group to form a tumor associated glycolinkage-containing substance lectin complex and measuring the amount of the tumor associated glycolinkage-containing substance lectin complex or unreacted lectin.

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**4,389,393**

## SUSTAINED RELEASE THERAPEUTIC COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT HYDROXYPROPYLMETHYLCELLULOSE

**Joseph M. Schor, Locust Valley; Ashok Nigalaye, Jackson Heights, both of N.Y., and Norman G. Gaylord, New Providence, N.J., assignors to Forest Laboratories, Inc., New York, N.Y.**

**Filed Mar. 26, 1982, Ser. No. 362,104**
**Int. Cl.³ A61K *9/22, 9/26***
**U.S. Cl. 424—19** **10 Claims**

1. A carrier base material combined with a therapeutically active medicament and shaped and compressed to a solid unit dosage form having a regular and prolonged release pattern upon administration, the carrier base material being one or more hydroxypropylmethylcelluloses or a mixture of one or more hydroxypropylmethylcelluloses and up to 30% by weight of the mixture of methyl cellulose, sodium carboxymethylcellulose and/or other cellulose ether, and wherein at least one of the hydroxypropylmethylcelluloses has a methoxy content of 16–24 weight-%, a hydroxypropoxyl content of 4–32 weight-% and a number average molecular weight of at least 50,000 and wherein the carrier base material constitutes less than about one third of the weight of the solid unit dosage form.

4,389,394

## METHODS FOR REDUCING DENTAL CARIES

David B. Drucker, Alderley Edge, England, assignor to Tulres Development (N.A.) N.V., Netherlands Antilles

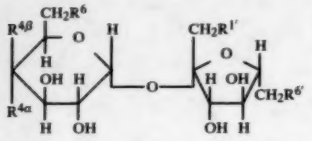
Continuation of Ser. No. 139,474, Apr. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 954,929, Oct. 26, 1978, abandoned. This application Jan. 27, 1982, Ser. No. 343,286

Claims priority, application United Kingdom, Sep. 22, 1978, 37840/78

Int. Cl.[3] A61K *7/20, 31/70*

U.S. Cl. 424—53 8 Claims

1. A method of preventing or limiting dental caries by administering to the subject an anticariogenic-effective amount of a chlorodeoxysucrose derivative of the general formula



(II)

wherein:

$R^{4\alpha}$ is a hydroxy group and $R^{4\beta}$ is a hydrogen atom, or, one of $R^{4\alpha}$ and $R^{4\beta}$ is a hydrogen atom and the other is a chlorine atom;

$R^6$ is a hydroxy group or, if at least one of $R^{4\alpha}$, $R^{4\beta}$ or $R^{1'}$ is a chlorine atom, then it is a hydroxy group or a chlorine atom;

$R^{1'}$ is a hydroxy group or a chlorine atom; and

$R^{6'}$ is a hydroxy group, or if at least one of $R^{4\alpha}$, $R^{4\beta}$ or $R^{1'}$ is a chlorine atom, then it is a hydroxy group or a chlorine atom.

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4,389,395

## LOW MOLECULAR WEIGHT COMPLEX OF POLYRIBOINOSINIC-POLYRIBOCYTIDYLIC ACID AND METHOD OF INDUCING INTERFERON

A. Martin Lerner, 3570 Tuckahoe, Birmingham, Mich. 48010 and Hilton B. Levy, 9400 Linden Ave., Bethesda, Md. 20814

Filed Jan. 9, 1981, Ser. No. 223,881

Int. Cl.[3] A61K *45/02*; C07C *103/52*

U.S. Cl. 424—85 8 Claims

1. A nuclease resistant hydrophilic complex of the nucleotide homopolymers polyriboinosinic and polyribocytidylic acid having homopolymer sedimentations coefficients of 4S, each homopolymer having a molecular weight of 25,000 or less, said complex including a stabilizing means adapted to stabilize the internucleotide linkages of the polyriboinosinic, polyribocytidylic acid polymer to phosdiesterases of primate serum.

4. An injectable preparation in a pharmaceutically acceptable aqueous carrier of a nuclease-resistant hydrophilic complex of a relatively low molecular weight polyriboinosinic-polyribcytidylic acid, poly-l-lysine and carboxymethycellulose, wherein the nucleotide homopolymers have sedimentation coefficients of 4S and each homopolymer has a molecular weight of about 25,000 or less.

5. A method of inducing the synthesis of interferon in a host which comprises administering a nuclease resistant hydrophilic complex of homopolymers of polyriboinosinic and polyribocytidylic acid having homopolymer sedimentation coefficients of 4S, each homopolymer having a molecular weight of about 25,000 or less and said complex including a stabilizing means adapted to stabilize the internucleotide linkages of the polyriboinosinic-polyribcytidylic acid polymer to phosdiesterases of primate serum.

4,389,396

## IMMUNOSTIMULATING PREPARATIONS BASED ON RIBOSOMAL RNA'S AND A PROCESS FOR THE PREPARATION OF THE RNA'S

Lucien Dussourd D'Hinterland; Gérard Normier; Anne-Marie Pinel, and Jacques Durand, all of Castres, France, assignors to Pierre Fabre, S.A., Paris, France

PCT No. PCT/FR80/00186, § 371 Date Aug. 18, 1981, § 102(e) Date Aug. 18, 1981

PCT Filed Dec. 19, 1980, Ser. No. 293,639

Claims priority, application France, Dec. 21, 1979, 79 31442

Int. Cl.[3] A61K *39/108, 39/02*; C07H *21/02*; A61K *31/70*

U.S. Cl. 424—92 10 Claims

1. A process for the preparation of bacterial ribosomal RNA comprising:

(a) providing a ground bacterial suspension;

(b) separating ribosomes from said suspension;

(c) extracting crude RNA from the separated ribosomes by mixing said ribosomes with an aqueous solution of sodium dodecyl sulfate and precipitating crude RNA; and

(d) treating said crude RNA with at least one proteolytic enzyme and precipitating the treated RNA.

8. A method of treating diseases attributable to immunodeficits with a non-specfic immunostimulating preparation comprising:

providing a non-specific immunostimulating preparation characterized by the absence of adjuvants comprising bacterial ribosomal RNA extracted from *Klebsiella pneumoniae* or *Serratia marcescens* as the sole active principle and a therapeutically acceptable support; and

administering an effective amount of said preparation to the patient being treated.

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4,389,397

## SOLUBILIZATION OF IVERMECTIN IN WATER

Pak-Kan A. Lo, Edison, and James B. Williams, Freehold, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 174,957, Aug. 4, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,124

Int. Cl.[3] A61K *31/70*

U.S. Cl. 424—180 6 Claims

1. A stabilized aqueous formulation which comprises from 0.1 to 7.5% w/v of an avermectin for parenteral administration or from 0.01 to 2.0% w/v of an avermectin for oral administration; from 0.5 to 2.5% of a surface active agent selected from polyoxyethylene sorbitan monoisostearate, polyoxyethylene sorbitan monostearate and polysorbate 80; from 10 to 60% of a cosolvent selected from glycerol formal, glycerine and polyethyleneglycol; and from 1 to 5% w/v of a substrate selected from benzyl alcohol, lidocaine, parabens and choline.

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4,389,398

## AMINO GLYCOSIDE ANTIBIOTICS HAVING ANTIPROTOZOAL AND ANTHELMINTIC ACTIVITY

David J. Cooper, Downingtown, Pa.; Jay A. Waitz, Fairfield, N.J.; Mac Counelis, New York, N.Y., and Jay Weinstein, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 752,375, Dec. 20, 1976, Pat. No. 4,110,439, which is a division of Ser. No. 618,647, Oct. 1, 1975, Pat. No. 4,049,796, which is a division of Ser. No. 389,774, Aug. 20, 1973, Pat. No. 3,915,955, which is a continuation-in-part of Ser. No. 48,017, Jun. 22, 1970, abandoned. This application Aug. 24, 1978, Ser. No. 937,620

Int. Cl.[2] A61K *31/71*

U.S. Cl. 424—181 6 Claims

1. A method of eliciting an anthelmintic response in animals afflicted with helminthiasis which comprises administering to said animals a therapeutically effective quantity for treating helminthiasis of a member selected from the group consisting of gentamicin A, gentamicin B, gentamicin $B_1$ and gentamicin X, their non-toxic acid addition salts and mixtures thereof.

**4,389,399**

## THIOCARBAMOYL HETEROCYCLE-ANTHRAQUINONE DERIVATIVES

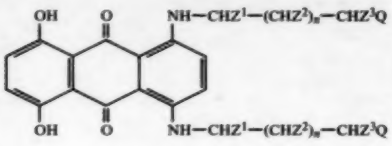
**Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Feb. 4, 1982, Ser. No. 345,700**

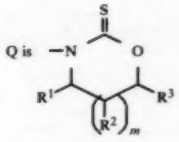
**Int. Cl.³ A61K** *31/42, 31/535;* **C07D** *263/16, 265/08*

**U.S. Cl. 424—248.5** **15 Claims**

**1.** An anthraquinone derivative of the formula



wherein:



$R^1$, $R^2$ and $R^3$ are each independently selected from hydrogen or alkyl of 1 to 3 carbons; $Z^1$, $Z^2$ and $Z^3$ are each independently selected from hydrogen or alkyl of 1 to 2 carbons; n is 0 or 1; and m is 0 or 1.

**13.** A method of inducing regression of leukemia cell growth in a patient or inhibiting growth of solid tumors in a patient, which comprises

administering by injection to said patient an effective amount of a derivative according to claim **1**.

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**4,389,400**

## 2,2-BIS(HALOALKENYL)-1-SUBSTITUTED-1-CYANO-ETHYLENE FUNGICIDES

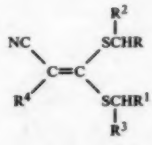
**Andrew W. Ho, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Mar. 25, 1982, Ser. No. 361,650**

**Int. Cl.³ A01N** *43/84, 37/34;* **C07C** *149/237*

**U.S. Cl. 424—248.52** **27 Claims**

**1.** A compound of the formula:



wherein

(A) R and $R^1$ are independently

1. lower alkenyl,
2. lower alkynyl,
3. lower alkenyl substituted with 1 to 3 of the same or different halogens, or
4. lower alkynyl substituted with 1 to 3 of the same or different halogens;

(B) $R^2$ and $R^3$ are independently

1. hydrogen or
2. lower alkyl;

(C) $R^4$ is

1. cyano,
2. phenyl,
3. phenyl substituted with 1 to 3 of the same or different halogens,
4. $—S(O)_mR^5$ wherein

(aa) m is 0, 1 or 2; and

(bb) $R^5$ is

(i) lower alkyl,

(ii) phenyl, or

(iii) phenyl substituted with 1 to 3 of the same or different substituents selected from

(1) halogen or

(2) lower alkyl,

5.

wherein $R^6$ is

(aa) phenyl,

(bb) phenyl substituted with 1 to 3 of the same or different halogens,

(cc)

wherein $R^7$ and $R^8$ are independently

(i) lower alkyl,

(ii) are joined to form a ring containing 4 to 6 carbons, or

(iii) are joined to form a 5- to 7-member ring containing 1 to 2 oxygens.

**24.** A method for controlling fungi which comprises applying to the fungus or its habitat a fungicidally effective amount of the compound of the formula defined in claim **1**.

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**4,389,401**

## ARTHROPOD REPELLENTS

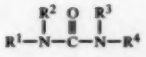
**Joel R. Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Jul. 10, 1979, Ser. No. 56,179**

**Int. Cl.³ A01N** *47/28, 47/32, 47/36, 47/38*

**U.S. Cl. 424—248.56** **6 Claims**

**1.** A method for repelling arthropods which comprises applying to an appropriate surface an effective repellent amount of the compound of the formula:



wherein $R^1$ is alkenyl or alkynyl; $R^2$ is alkenyl, alkynyl or cycloalkyl, or phenyl lower alkyl, $R^3$ is hydrogen and $R^4$ is alkyl, alkoxycarbonylakyl or cycloalkyl or $R^2$ and $R^3$ are joined to form a dimethyleneoxy or $R^2$ and $R^4$, taken together with the nitrogen atom to which they are attached, may be joined to form a 5- to 7-membered heterocyclic ring.

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**4,389,402**

## METHOD FOR THE CONTROL OF CATTLE GRUBS USING PENTADIENONE HYDRAZONES

**Robert H. Schenkel, Yardley, Pa., assignor to American Cyanamid Company, Stamford, Conn.**

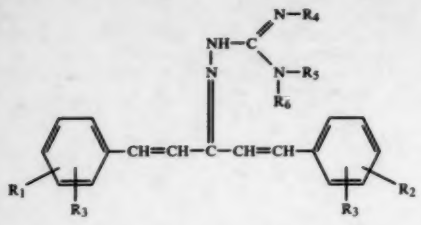
**Filed Aug. 21, 1981, Ser. No. 295,056**

**Int. Cl.³ A61K** *31/505, 31/55*

**U.S. Cl. 424—251** **6 Claims**

**1.** A method for protecting ruminant, domestic, and farm animals from infestation by the larvae of flies of the family Hypodermatidae comprising, administering to larvae-infested

animals a larvicidally effective amount of a compound having the formula:



wherein $R_1$ and $R_2$ each is hydrogen, halogen, $CF_3$, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy or $C_1$–$C_4$ alkylthio; $R_3$ is hydrogen or methyl, provided that when $R_3$ is methyl, $R_1$ and $R_2$ is each also methyl; $R_4$ and $R_5$ represent hydrogen or $C_1$–$C_4$ alkyl, and when taken together, an alkylene group of 2 to 6 carbon atoms, a methyl substituted or a phenyl substituted alkylene group of 2 to 4 carbon atoms, a dimethyl substituted alkylene group of 2 to 4 carbon atoms or 1,2-cyclohexylene; and $R_6$ is hydrogen or $C_1$–$C_4$ alkyl; or salts thereof.

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**4,389,403**

## 1-AROYL-2-PHENYLAMINO-2-IMIDAZOLINES, DRUGS CONTAINING THESE COMPOUNDS, AND USE THEREOF

**Hans-Joachim May, Neustadt; Dieter Lenke, Ludwigshafen; Josef Gries, Wachenheim; Hans-Juergen Teschendorf, Ludwigshafen, and Wolfgang Worstmann, Hiltrup, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

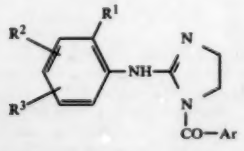
**Filed Mar. 3, 1981, Ser. No. 240,111**

**Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011327**

**Int. Cl.³ A61K** *31/415, 31/47;* **C07D** *401/06*

**U.S. Cl. 424—258** **14 Claims**

**1.** A 1-aroyl-2-phenylamino-2-imidazoline of the general formula I



(I)

where

$R^1$ and $R^2$ are identical or different and each is chlorine, bromine, fluorine, methyl, ethyl, methoxy, trifluoromethyl or cyano,

$R^3$ has the meanings given for $R^1$ and $R^2$ or is hydrogen and

Ar is an unsubstituted or substituted monocyclic or bicyclic heteroaromatic radical containing 1, 2 or 3 nitrogen and-/or oxygen and/or sulfur atoms, and its salts with physiologically tolerated acids.

**13.** The method of treating hypertonia in a patient suffering therefrom which comprises administering an effective amount of a compound as claimed in claim **1**.

**4,389,404**

## PAIN-KILLING PREPARATION

**Vladimor I. Zhorov, Mishina, 12 kv. 96; Jury E. Kirsh, Leninsky prospekt, 70/11, kv. 444; Viktor I. Shumsky, ulitsa Turisticheskaya, 20, korpus 1, kv. 371; Temuri M. Karaputadze, ulitsa Akademika Vargi, 8 kv. 1, and Jury J. Bairamov, 4 Vyatsky pereulok, 20 kv. 67, all of Moscow, U.S.S.R.**

**PCT No. PCT/SU80/00199, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01653, PCT Pub. Date Jun. 25, 1981**

**PCT Filed Dec. 16, 1980, Ser. No. 287,738**

**Claims priority, application U.S.S.R., Dec. 17, 1979, 2874471**

**Int. Cl.³ A61U** *31/485*

**U.S. Cl. 424—260** **3 Claims**

**1.** A pain-killing composition comprising poly-N-vinylpyrrolidone having a molecular mass of 30,000 to 40,000, morphine hydrochloride and water, said poly-N-vinylpyrrolidone being present in an amount between 250 and 310 grams per liter of water and said morphine hydrochloride being present in an amount between 5 and 6.25 grams per liter of water.

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**4,389,405**

## 1,10-DIMETHYL-2,7-DIHYDROOXAYOHIMBANES AN ANTI-ARRHYTHMIC USE THEREOF

**Jean A. Hannart, Dion Valmont, Belgium, assignor to Omnichem, S.A., Brussels, Belgium**

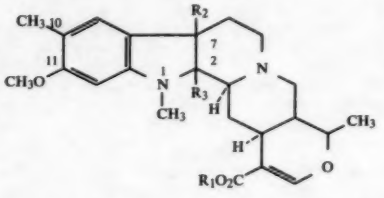
**Filed Jan. 7, 1981, Ser. No. 223,159**

**Claims priority, application Belgium, Jan. 9, 1980, 198889**

**Int. Cl.³ A61K** *31/475;* **C07D** *495/00*

**U.S. Cl. 424—262** **8 Claims**

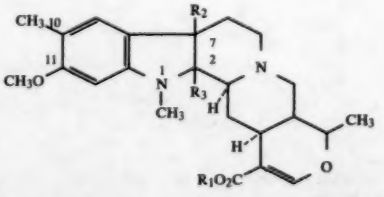
**1.** Oxayohimbanes having the formula:



(I)

wherein $R_1$ is selected from the group consisting of an alkyl group having 1 to 8 carbon atoms, dialkyl aminoalkyl group having 1 to 8 carbon atoms and wherein $R_2$ and $R_3$ are hydrogen atoms, wherein dialkylamino can form pyrrolidino or piperidino and pharmaceutically acceptable mineral or organic acid addition salts thereof.

**5.** A pharmaceutical composition for the treatment of cardiac arrhythmia comprising an effective amount an oxayohimbane having the formula



(I)

wherein $R_1$ is selected from the group consisting of an alkyl group having 1 to 8 carbon atoms, and dialkylaminoalkyl group having 1 to 8 carbon atoms or and wherein $R_2$ and $R_3$ are hydrogen atoms, wherein dialkylamino can form pyrrolidino or piperidino and pharmaceutically acceptable mineral or organic acid addition salts thereof and a pharmaceutically acceptable carrier.

**8.** The process for treating disorders of the heart rhythm of

mammals wherein a pharmaceutical composition as claimed in claim 5 is used.

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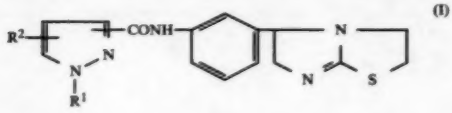
4,389,406

## META-PYRAZOLYLAMINOTETRAMISOLE ANALOGS AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Roderick J. Dorgan, Outwood, and Richard A. Webster, Sutton, both of England, assignors to Beecham Group Limited, England

Filed May 15, 1981, Ser. No. 263,927
Claims priority, application United Kingdom, May 30, 1980, 8017694
Int. Cl.³ A61K 31/425; C07D 513/04
U.S. Cl. 424—270 11 Claims

1. A compound of formula (I) in the l-form



(I)

wherein $R^1$ and $R^2$ are the same or different and each is selected from hydrogen, ($C_{1-7}$) alkyl, and phenyl and the dotted line is an optional direct bond, or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition having anthelmintic activity comprising a therapeutically effective amount of a compound of formula (I), or a pharmaceutically acceptable salt thereof, as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

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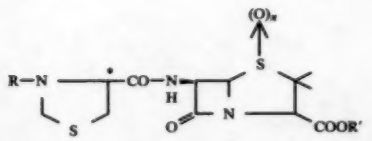
4,389,407

## 1,3-THIAZOLIDIN-4-YL-CARBOXYLIC ACID DERIVATIVES AND ANTIBACTERIAL COMPOSITIONS THEREOF

Michele Di Schiena, and Vittoria Orru, both of Trezzano sul Naviglio, Italy, assignors to Ausonia Farmaceutici s.r.l., Rome, Italy

Filed Jul. 1, 1981, Ser. No. 279,425
Claims priority, application Italy, Jul. 15, 1980, 23455 A/80
Int. Cl.³ A61K 31/43; C07D 499/76
U.S. Cl. 424—271 11 Claims

1. A compound of formula



(I)

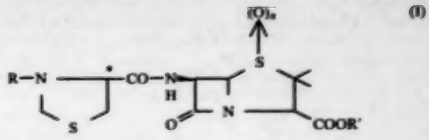
wherein:

R is hydrogen, trichloroethoxycarbonyl, acetyl or pivalyol;

R′ represents hydrogen, a pharmaceutically acceptable sodium, phthalidyl, pivaloyloxymethyl or trichloroethyl,

n is zero or 1; the carbon atom of the 1,3-thiazolidine nucleus has the D- or L-configuration or the racemic form; or a salt thereof with a pharmaceutically acceptable acid.

11. An antibacterial pharmaceutical composition for human, veterinary or agricultural use which contains a pharmaceutically acceptable carrier and as the active ingredient, an antibacterially effective amount of at least one compound of formula I:



(I)

wherein:

R is hydrogen, trichloroethoxycarbonyl, acetyl or pivaloyl;

R′ represents hydrogen, a pharmaceutically acceptable sodium, phthalidyl, pivaloyloxymethyl or trichloroethyl, n is zero or 1; the carbon atom of the 1,3-thiazolidine nucleus has the D- or L-configuration or the racemic form; and a salt thereof with a pharmaceutically acceptable acid.

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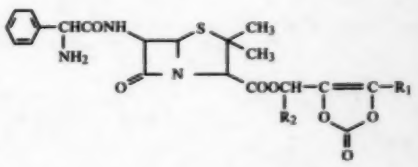
4,389,408

## NOVEL AMPICILLIN ESTERS AND PRODUCTION THEREOF

Fumio Sakamoto, Osaka; Shoji Ikeda, Ibaraki; Goro Tsukamoto, Toyonaka, and Isamu Utsumi, Kyoto, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

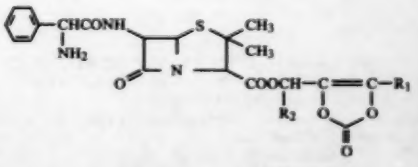
Continuation-in-part of Ser. No. 257,562, Apr. 27, 1981, abandoned. This application Dec. 4, 1981, Ser. No. 327,735
Claims priority, application Japan, Apr. 30, 1980, 55-58510; May 22, 1980, 55-68444
Int. Cl.³ A61K 31/43; C07D 499/32, 499/42
U.S. Cl. 424—271 9 Claims

1. An Ampicillin ester of the formula



wherein $R_1$ represents a hydrogen atom, a methyl group or an aryl group, and $R_2$ represents a hydrogen atom or may be taken together with $R_1$ to form a divalent carbon chain residue, or a pharmaceutically acceptable acid addition salt thereof.

6. An antibacterial agent comprising an antibacterially effective amount of an Ampicillin ester of the formula



wherein $R_1$ represents a hydrogen atom, a methyl group or an aryl group, and $R_2$ represents a hydrogen atom or may be taken together with $R_1$ to form a divalent carbon chain residue, or a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutically acceptable carrier.

**4,389,409**

**1-(α-n-BUTYLTHIO-2,4-DICHLOROPHENETHYL-)IMIDAZOL-3-yl AND FUNGICIDAL USE THEREOF**

**George A. Miller, Maple Glen, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Mar. 18, 1977, Ser. No. 779,211**

**Int. Cl.³ C07D *233/64;* A01N *43/50***

**U.S. Cl. 424—273 R** **3 Claims**

**1.** 1-(alpha-n-butylthio-2,4-dichlorophenethyl)imidazol-3-yl.

**3.** A method for controlling phytopathogenic fungi which comprises applying to the plant, to the plant seed or to the plant habitat, a fungicidally effective amount of a compound according to claim **1**.

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**4,389,410**

**ESTERS OF MONIC ACID A USEFUL AS ANTIBACTERIAL AND ANTIMYCOPLASMAL AGENTS**

**Peter J. O'Hanlon, Redhill, and Norman H. Rogers, Horsham, both of England, assignors to Beecham Group Limited, England**

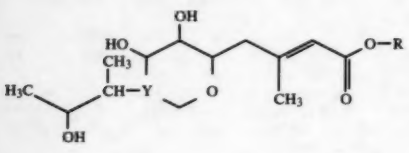
**Filed Jul. 21, 1981, Ser. No. 285,612**

**Claims priority, application United Kingdom, Jul. 24, 1980, 8024221**

**Int. Cl.³ A61K *31/35;* C07D *309/06***

**U.S. Cl. 424—283** **10 Claims**

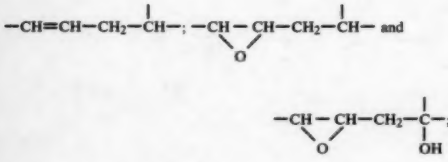
**1.** A compound of formula (II):



(II)

wherein

Y is selected from



and

R is a group selected from $C_{1-20}$ alkyl, $C_{3-8}$ cycloalkyl; $C_{3-20}$ alkenyl; benzyl; cycloalkylalkyl; furyl and furyl alkyl; said group being substituted by formyl.

**9.** An antibacterial or antimycoplasmal, pharmaceutical or veterinary composition comprising an effective, non-toxic amount of a compound according to claim **1** and a pharmaceutically or veterinarily acceptable carrier therefor.

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**4,389,411**

**CYANO-(2,4-DICHLOROPHENYL)METHYL ETHYL ESTER OF CARBONIC ACID USEFUL AS A NEMATOCIDE**

**Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Mar. 3, 1982, Ser. No. 354,479**

**Int. Cl.³ A01N *47/06;* C07C *121/75***

**U.S. Cl. 424—301** **4 Claims**

**1.** Cyano-(2,4-dichlorophenyl)methyl ethyl ester of carbonic acid.

**3.** A nematocidal composition comprising an inert horticultural carrier and as a nematocide, the compound of claim **1**, the concentration of said nematocide being from 0.0001 to 50 percent by total weight of the composition.

**4.** A method for protecting plants from attack from nematodes which comprises treating the plants to be protected with an effective dosage of the compound of claim **1**.

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**4,389,412**

**SUBSTITUTED CYCLOPROPANECARBOXYLIC ACID ESTERS AND PESTICIDAL COMPOSITIONS CONTAINING THE SAME AS ACTIVE INGREDIENT**

**Fumio Mori; Manzo Shiono, both of Kurashiki, and Yoshiaki Omura, Okayama Prefecture, all of Japan, assignors to Kuraray Company, Ltd., Okayama Prefecture, Japan**

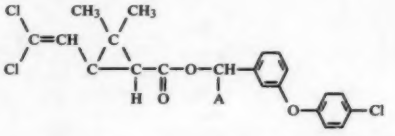
**Filed Mar. 27, 1980, Ser. No. 134,589**

**Claims priority, application Japan, Mar. 30, 1979, 54-39021; Jun. 12, 1979, 54-74387**

**Int. Cl.³ A01N *53/00***

**U.S. Cl. 424—305** **1 Claim**

**1.** A method for controlling insects or acarids which comprises applying to a habitat of the insects or acarids an effective amount of a substituted cyclopropanecarboxylic acid ester of the general formula:



wherein A is a hydrogen atom or an ethynyl group and said ester is applied to rice paddy.

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**4,389,413**

**9,11-METHANO-13-AZA-11A-CARBATHROMBANOIC ACID ANALOGUES**

**Nobuyuki Hamanaka, 11-38, Koaza Hiroshiki, Ooaza Ooyamazaki, Ooyamazaki-cho, Otokuni-gun, Kyoto; Shinsuke Hashimoto, 3-2, Matsunami-cho, Nishinomiya-city, Hyogo, and Masaki Hayashi, 5-10, Nanpeidai 4-chome, Takatsuki-city, Osaka, all of Japan**

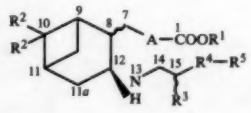
**Filed Jul. 22, 1981, Ser. No. 285,723**

**Claims priority, application Japan, Jul. 22, 1980, 55-99371; Dec. 26, 1980, 55-183762**

**Int. Cl.³ A61K *31/557;* C07C *101/14***

**U.S. Cl. 424—305** **43 Claims**

**1.** A compound of the general formula:



V

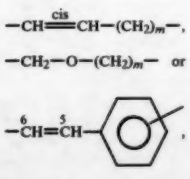
[wherein A represents

$$-CH_2CH_2-(CH_2)_m-, \quad \text{(i)}$$

$$-CH\overset{cis}{=\!=}CH-(CH_2)_m-, \quad \text{(ii)}$$

$$-CH_2-O-(CH_2)_m- \text{ or} \quad \text{(iii)}$$

(iv)



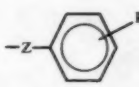
(in which m is an integer of 1 to 6, the double bond between the

carbon atoms in positions 5 and 6 in (iv) is in cis or trans-configuration or a mixture thereof and the phenylene group in (iv) represents o-, m- or p-phenylene), $R^1$ represents a hydrogen atom or a straight- or branched-chain alkyl group of 1 to 12 carbon atoms, two $R^2$ both represent hydrogen atoms or methyl groups, $R^3$ represents a hydrogen atom or a hydroxy group, $R^4$ represents a single bond or a straight- or branched-chain alkylene group of 1 to 5 carbon atoms, $R^5$ represents

(i) a straight- or branched-chain alkyl, alkoxy or alkylthio group of 1 to 8 carbon atoms,

(ii) a cycloalkyl or cycloalkyloxy group of 4 to 7 carbon atoms being unsubstituted or substituted by at least one straight- or branched-chain alkyl group of 1 to 8 carbon atoms or

(iii)



(in which Z represents a single bond, an oxygen atom or a sulfur atom and $R^6$ may occupy any of the free positions on the phenyl ring and represents a hydrogen atom, a halogen atom, a hydroxy group, a straight- or branched-chain alkyl or alkoxy group of 1 to 5 carbon atoms, a trihalomethyl group, an amino group or a mono- or dialkyl-amino group of 1 to 5 carbon atoms)

and the wavy line ~ attached to the carbon atom in position 15 represents α- or β-configuration or a mixture thereof, provided that, when $R^3$ represents a hydroxy group and $R^4$ represents a single bond, $R^5$ does not represent an alkoxy group, an alkylthio group, a cycloalkyloxy group, a phenoxy group and a phenylthio group],

or cyclodextrin clathrates thereof, or when $R^1$ represents a hydrogen atom, non-toxic salts thereof.

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**4,389,414**

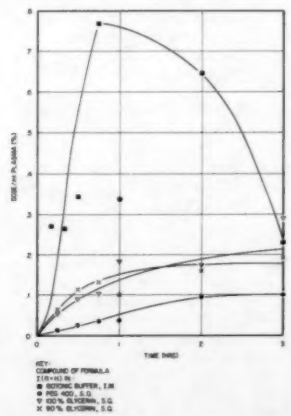
## PROSTAGLANDIN COMPOSITIONS

**John S. Kent, Cupertino, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

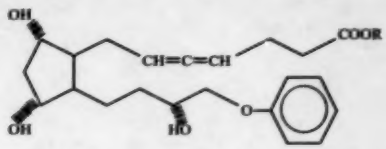
**Continuation of Ser. No. 75,912, Jul. 16, 1979, abandoned. This application May 11, 1981, Ser. No. 262,102**

**Int. Cl.³ A61K** *31/235*

**U.S. Cl. 424—308** **6 Claims**



**1.** An injectable composition containing less than 5% by weight water for producing a luteolytic effect in a mammal which comprises polyethylene glycol having a molecular weight of 380 to about 630; a luteolytic effective amount of a compound chosen from those represented by the formula



wherein R is hydrogen or alkyl of 1 through 4 carbon atoms; and optionally a phrmaceutically acceptable excipient, said composition exhibiting a prolonged absorption of said compound by said mammal.

**4.** A method for producing a prolonged luteolytic effect in a mammal which method comprises parenterally administering the composition of claim **1** to said mammal.

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**4,389,415**

## METHOD OF TREATING HYPERTENSION

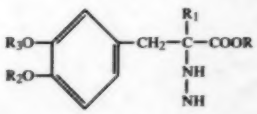
**Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 82,249, Oct. 5, 1979, abandoned, which is a continuation of Ser. No. 871,879, Jan. 24, 1978, abandoned. This application Jul. 20, 1981, Ser. No. 285,215**

**Int. Cl.³ A61K** *31/24, 31/195*

**U.S. Cl. 424—309** **2 Claims**

**1.** A method of treating hypertension which comprises consecutively administering to a hypertensive patient in an antihypertensively effective ratio an effective amount therefor first of (a) racemic mixture of L-isomer of a hydrazino phenylpropionic acid decarboxylase inhibitor of the formula



wherein R, $R_1$, $R_2$, and $R_3$ are independently selected from hydrogen and $C_1$–$C_4$ alkyl or a pharmaceutically acceptable salt thereof and then an effective amount therefor of (b) α-methyl-p-tyrosine, with (a) being administered parenterally and (b) being administered orally.

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**4,389,416**

## DIPHENYL ETHER, DIPHENYL THIOETHER AND DIPHENYL METHANE PHENOL MANNICH BASES

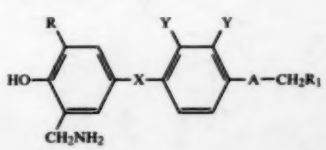
**Jacob J. Plattner, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed Oct. 9, 1981, Ser. No. 310,164**

**Int. Cl.³ A61K** *31/215;* **C07C** *101/30, 103/29, 91/16*

**U.S. Cl. 424—309** **30 Claims**

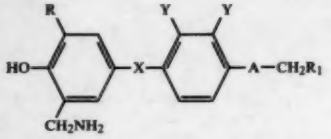
**1.** A compound of the formula



wherein R is hydrogen, loweralkyl, aminomethyl or halo; $R_1$ is carboxy, carboxyloweralkyl, aminocarbonyl, hydroxymethyl, anilinomethyl or aminomethyl; A is oxygen, $CH_2$, sulfur or a single bond; X is oxygen, $CH_2$, sulfur or sulfoxide; and Y is

hydrogen, loweralkyl or halo and may be the same or different, and pharmaceutically acceptable salts thereof.

**11.** A method of increasing the urinary excretion of a patient comprising administering to a patient in need of such treatment a therapeutically effective amount of a diuretic agent of the formula



wherein R is hydrogen, loweralkyl, aminomethyl or halo; $R_1$ is carboxy, carboxyloweralkyl, aminocarbonyl, hydroxymethyl, anilinomethyl or aminomethyl; A is oxygen, $CH_2$, sulfur or a single bond; X is oxygen, $CH_2$, sulfur or sulfoxide; and Y is hydrogen, loweralkyl or halo and may be the same or different, and pharmaceutically acceptable salts thereof.

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**4,389,417**

## TREATMENT OF GRAY MATTER EDEMA

**Robert S. Bourke, Slingerlands, N.Y., and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

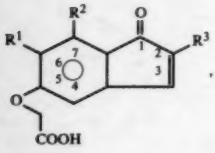
**Continuation of Ser. No. 184,590, Sep. 5, 1980, abandoned, which is a continuation of Ser. No. 57,637, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 880,256, Feb. 22, 1978, abandoned. This application Dec. 30, 1981, Ser. No. 336,107**

**Int. Cl.³ A61K** *31/19*

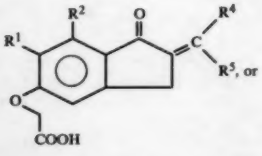
**U.S. Cl. 424—317** **25 Claims**

**1.** A method of treating persons with gray matter edema which comprises administering to such a person an effective amount of a compound of the formulae:

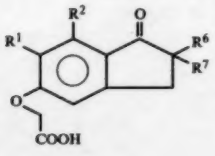
I



II



III



wherein

$R^1$ is H, $CH_3$, or Cl

$R^2$ is $CH_3$ or Cl

$R^3$ is alkyl of one through five carbons, cycloalkyl of four through seven carbons, phenyl, and phenylalkyl or halophenylalkyl where the alkyl is one through three carbons

$R^4$ is H or alkyl of one through five carbons

$R^5$ is H, alkyl of one through five carbons, phenyl, halo-substituted phenyl, trifluoro alkyl of one through four carbons, or $R^4$ and $R^5$ taken together with the carbon to which they are attached may be joined to form a cycloalkylidene ring of four through six carbons such as cyclohexylidene,

$R^6$ is (1) alkyl of one through five carbons, (2) alkenyl of three through five carbons, (3) cycloalkyl or cycloalkylalkyl of four through seven carbons, or (4) substituted or unsubstituted aryl such as phenyl or aralkyl or alkoxyaryl where alkyl is of one through three carbons, and

$R^7$ is H or alkyl of one through five carbons or a pharmaceutically acceptable salt, ester, or amide derivative thereof.

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**4,389,418**

## SKIN CARE COMPOSITION

**Colin K. Burton, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.**

**Filed Feb. 25, 1981, Ser. No. 238,232**

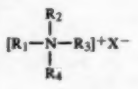
**Int. Cl.³ A61K** *7/00, 7/48*

**U.S. Cl. 424—365** **5 Claims**

**1.** A skin care composition for moisturizing and conditioning the skin having cosmetically acceptable tactile properties which comprises a water-out emulsion consisting essentially of:

(a) From about 1 to 10% by weight of petrolatum or mineral oil;

(b) From about 2 to 12% by weight of a quaternary ammonium compound of the formula



wherein $R_1$ and $R_2$ are each long chain, substantially linear alkyl groups having from about 16 to 22 carbon atoms, $R_3$ and $R_4$ are each lower alkyl groups having from about 1 to 3 carbon atoms and X is a salt-forming anion;

(c) From about 1.5 to 5% by weight of a fatty alcohol;

(d) From about 1 to 8% by weight of a fatty ester emollient; and

(e) From about 75 to 95% by weight aqueous vehicle.

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**4,389,419**

## VITAMIN ENCAPSULATION

**Franklin Lim, Richmond, and Richard D. Moss, Chester, both of Va., assignors to Damon Corporation, Needham Heights, Mass.**

**Filed Nov. 10, 1980, Ser. No. 205,340**

**Int. Cl.³ A23L** *1/30;* **B01J** *13/02*

**U.S. Cl. 426—72** **21 Claims**

**1.** A process for producing mechanically stable, multi-compartmentalized capsules containing an oil soluble nutrient, said process comprising the steps of:

A. forming an emulsion comprising a mixed aqueous solution of an alkali metal alginate and another non-toxic, water-soluble, alcohol-insoluble substance and a dispersed oil phase containing a nutrient;

B. forming discrete droplets of said emulsion;

C. immersing said droplets in an alcoholic solution of multivalent cations to convert said droplets to shape-retaining, water-insoluble alginate beads and to precipitate said alcohol-insoluble substance therewithin; and

D. drying said beads.

**18.** A composition of matter comprising a mechanically stable matrix consisting essentially of a water-insoluble multivalent cation containing alginate structure and another water-soluble, alcohol-insoluble polysaccharide, said matrix defining a plurality of compartments containing an oleophilic material.

21. The composition of claim 18 wherein said oleophilic material is a vitamin.

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4,389,420

## DOUGH GLAZE

Samuel H. Yong, Minneapolis; Donna J. Perlbachs, Edina; Glenn R. Wallin, Minneapolis, and Roberta C. Houle, Champlin, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,582
Int. Cl.³ A21D 13/00
U.S. Cl. 426—94 10 Claims

1. A glazed dough product comprising:
a mass of fresh dough made from cereal grain flour;
a coating of glaze on the exterior of said dough mass, said glaze comprising a proteinaceous liquid which contains as an essential component protein having a viscosity above $10^5$ centipoise measured at 5.5° C. whereby the glaze is on the next exterior surface of the dough during storage and after baking.

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4,389,421

## METHOD FOR CONTROLLING LIGHT STABILITY IN MALT BEVERAGES AND PRODUCT THEREOF

S. R. Palamand, St. Louis, Mo., assignor to Busch Industrial Products Corporation

Filed Oct. 30, 1981, Ser. No. 316,466
Int. Cl.³ A23L 2/00
U.S. Cl. 426—330.4 19 Claims

1. A malt beverage, comprising a light stabilizing material selected from the group consisting of organic compounds containing 1,8 epoxy groups and mixtures of organic compounds containing 1,8 and 1,4 epoxy groups in an amount sufficient to extend light stability, whereby the malt beverage is resistant to sunstruck flavor.

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4,389,422

## METHOD FOR PRODUCING AROMATIZED MICROPOROUS SUBSTRATES

Stephen F. Hudak, Croton-on-Hudson, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 139,058, Apr. 10, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,458
Int. Cl.³ A23L 1/22, 1/222; A23F 3/40, 5/46
U.S. Cl. 426—388 6 Claims

1. A method for producing aroma loaded microporous particles of vegetable material which comprises spraying an aqueous solution of said vegetable material into an anhydrous organic solvent which will dehydrate the solution and form microporous particles of soluble solids having an average particle size of less than 200 microns in diameter, thereafter separating the particles from the water-containing solvent and removing residual solvent and then loading the microporous particles with volatile aromatics.

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4,389,423

## PROCESS FOR THE PRODUCTION OF POWDERED PROTEIN MATERIALS FROM ANIMAL RAW MATERIAL

Toni B. Madsen, Fredericia, Denmark, assignor to Danske Andelsslagteriers Kodfoder-og Albuminfabrik, Lunderskov, Denmark

Filed Jan. 14, 1981, Ser. No. 224,929
Claims priority, application Denmark, Jan. 31, 1980, 80406
Int. Cl.³ A23J 1/10
U.S. Cl. 426—417 7 Claims

1. A process for the production of protein products from bone containing animal raw material comprising:
(a) grinding the bone containing animal raw material,
(b) heat treating the ground animal raw material at a temperature above 100° C. in order to obtain a mixture consisting of solids in a fluid phase,
(c) mechanically separating said mixture in order to produce a fluid phase, and a moist protein-containing bone/meal fraction,
(d) drying the moist bone/meal fraction,
(e) separating the dried bone/meal fraction into a first protein product containing bone pieces and a second powdered protein product,
(f) separating said fluid phase into a sludge, an aqueous protein phase and a fat containing phase,
(g) returning the sludge to step (b) or step (c),
(h) passing the fat containing phase on to a fat purification apparatus, and
(i) spray-drying the protein phase separately in order to produce a third powdered protein product.

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4,389,424

## PRODUCTION OF SEMIPROCESSED FRIED POTATO PIECES FOR PRESERVATION AT ROOM TEMPERATURE

Hiroshi Hasegawa, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 127,054, Mar. 4, 1980, abandoned. This application May 18, 1981, Ser. No. 264,239
Claims priority, application Japan, Jun. 4, 1979, 54-68845
Int. Cl.³ A23B 7/14; A23L 1/216
U.S. Cl. 426—546 9 Claims

1. A process for producing semiprocessed fried potatoes for preservation at room temperature which comprises: pre-frying raw potato pieces, having a shape-retaining rigidity, in deep edible oil to partially dry the same so that the water content of the potato pieces is reduced by about 10 to 20 percent by weight to a water content of 61 to 72 percent by weight, said potato pieces having been prepared by washing, peeling and cutting raw potatoes; placing the pieces thus pre-fried into a packaging bag made of a sheet material having a gas-barrier property and lightproofness; gas-tightly sealing the bag thereby to package the pieces; and sterilizing by heating the potato pieces thus packaged.

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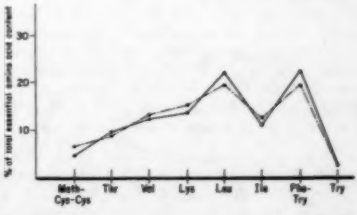
4,389,425

## METHOD OF MAKING SOY MILK CONTAINING STABILIZED PROTEIN

Jack Burr, II, P.O. Box 789, Dunedin, Fla. 33528

Filed Jun. 11, 1981, Ser. No. 272,738
Int. Cl.³ A23C 11/10
U.S. Cl. 426—598 21 Claims




1. A process for making a bovine milk substitute or a bovine milk extender, comprising the steps of,
preparing a predetermined quantity of soy beans for subsequent treatment by soaking the same in water for a predetermined time and then blanching said beans,
preparing an acidified water solution to provide a source of negatively charged ions for subsequent use in said process,
introducing said prepared beans and said acidified water solution into a first homogenizer means so that the beans are ground to a substantially uniform state or consistency

by said first homogenizer means, so that the protein-containing bean cells are ruptured in the presence of said acidified water solution within said first homogenizer means releasing to the acidified water solution a protein and starch extract to form an extract solution, and so that the amino acids in the proteins released into said acidified water solution by said cell rupturing will be in positively charged form and electrically associated with negatively charged ions supplied by said acidified water solution,

desludging the extract solution,

quickly elevating the temperature of the desludged extract solution under boil-preventing pressure to deactivate enzymes,

thereafter introducing an alkaline compound into the extract solution to increase the pH of the resulting alkaline extract solution and to provide a source of positively charged ions,

treating the alkaline extract solution by removing a predetermined quantity of hydrogen ions from the positively charged amino acid molecules released into said acidified water solution in said first homogenizer means so that the amino acids in the proteins are converted from positively charged amino acid molecules to negatively charged amino acid molecules so that the resulting anionic-form amino acid ions will enter into electrical association with the positively charged ions provided during said pH increasing step,

whereby the resulting alkaline extract solution maintains protein in suspension in a form that substantially duplicates the form that protein is maintained in suspension in bovine milk.

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**4,389,426**

## 25 TO 65 WT. % FAT CONTENT WATER-IN-OIL EMULSION SPREAD WHOSE AQUEOUS PHASE COMPRISES A GELLING SYSTEM

**Hermann A. W. Reissmann, Ellerbek, and Bernd T. Milo, Hamburg, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.**

**Filed Nov. 13, 1981, Ser. No. 321,028**

**Claims priority, application United Kingdom, Nov. 22, 1980, 8037545**

**Int. Cl.³ A23D** *5/00, 3/00*

**U.S. Cl. 426—602** **6 Claims**

1. Water-in-oil edible emulsion spread having a fat content ranging from 25 to 65 wt%, which comprises a dispersed aqueous phase containing a gelling system comprising:

(i) at least one hydrocolloid selected from the group consisting of dextrins having a DE-value of at least 20, pectin having a degree of esterification of at least 48%, lambda carrageenan and alginates; and

(ii) at least one hydrocolloid selected from the group consisting of guar gum, locust bean gum and iota carrageenan

wherein an effective amount of each type of said hydrocolloid is employed sufficient to stabilize the emulsion spread under storage conditions while de-stabilizing the emulsion spread under palate conditions affording a pleasant melting behavior.

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**4,389,427**

## PROCESS FOR THE CONTINUOUS ROASTING OF COCOA KERNEL PASTE

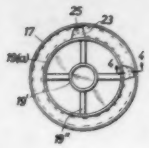
**Armin Schmitt, Am Birkeneck 88, 6056 Heusenstamm, and Rüdiger Nosthinski, Frankenstr. 1, 6051 Dietzenbach-Steinberg, both of Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 136,399, Apr. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 948,248, Oct. 3, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,856**

**Int. Cl.³ A23G** *1/02*

**U.S. Cl. 426—631** **21 Claims**

1. A process comprising roasting liquid cocoa paste by applying the same as a thin layer which is advanced on an unheated surface and heating the paste by passing a hot gas along the layer and by generating shearing and friction forces in said layer, said shearing and friction forces being generated by




scraping paste out of said layer and spraying the thusly scraped paste back into the layer.

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**4,389,428**

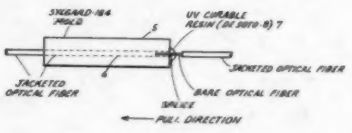
## METHOD OF REJACKETING A FUSION SPLICE IN AN ULTRAVIOLET LIGHT CURABLE RESIN JACKETED OPTICAL FIBER

**Frederick T. McDuffee, Manchester, N.H., and Carrie L. Kozikowski, Bedford, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Mar. 15, 1982, Ser. No. 357,950**

**Int. Cl.³ B05D** *3/06*

**U.S. Cl. 427—54.1** **26 Claims**




1. A method of rejacketing a fusion splice in an ultraviolet light curable resin jacketed optical fiber comprising the steps of

forming an ultraviolet light transparent mold including a cylindrical passageway having a diameter equal to the diameter of said jacketed optical fiber;

placing said jacketed optical fiber in said passageway with said splice without a jacket thereon being disposed a predetermined distance from said transparent mold;

applying an ultraviolet curable resin to an end of said passageway adjacent said splice;

pulling said splice very slowly through said resin into said passageway along with a portion of said resin;

curing said resin under an ultraviolet lamp; and

removing said transparent mold from said optical fiber after said splice has been completely rejacketed.

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**4,389,429**

## METHOD OF FORMING INTEGRATED CIRCUIT CHIP TRANSMISSION LINE

**Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Division of Ser. No. 160,031, Jun. 16, 1980, Pat. No. 4,379,307. This application Jun. 28, 1982, Ser. No. 393,149**

**Int. Cl.³ B05D** *5/12;* **C23F** *1/02;* **H01L** *21/306*

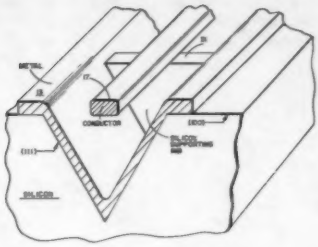
**U.S. Cl. 427—90** **5 Claims**

1. A method for making interconnections on integrated chips which substantially reduces the RC time constant of present interconnections, comprising the steps of:

applying a conductive coating to a semiconductor substrate;

selectively etching or milling through the conductive coating to define a first conductor;

etching into the substrate and under at least one elongated portion of the first conductor; and



applying a further conductive coating to the etched substrate to comprise a second conductor in spaced relation to the first conductor.

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**4,389,430**

## METHOD AND ARRANGEMENT FOR COATING ORIFICE WALLS

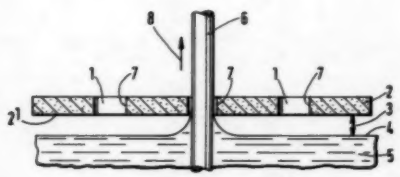
**Renate Rettich, New-Ulm, and Wilhelm Schwedes, Ulm-Ermingen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 6, 1981, Ser. No. 318,913**

**Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3041986**

**Int. Cl.³ B05C** *7/06, 5/02;* **B05D** *1/28, 7/22*

**U.S. Cl. 427—230** **13 Claims**



1. A method of coating the inner walls of at least one orifice of a perforated plate or board with a liquid wherein the plate has a surface which is held substantially parallel to the surface of said liquid, without touching said liquid and at least one element at least touches said liquid through said at least one orifice and as a result of the movement of said element and/or as a result of the capillarity at the interface between said liquid and said element, said walls of said orifice are wetted by said liquid.

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**4,389,431**

## PROCESS FOR MECHANICALLY DEPOSITING HEAVY METALLIC COATINGS

**David W. Erismann, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Continuation-in-part of Ser. No. 230,861, Feb. 2, 1981, abandoned, which is a division of Ser. No. 148,732, May 12, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,737**

**Int. Cl.³ B05D** *3/12*

**U.S. Cl. 427—242** **5 Claims**

1. A mechanical plating process for providing metallic articles with a heavy, thick metallic coating of a mechanical plating metal, comprising the steps of:

(a) providing an acidic aqueous mixture of said metallic articles, impact media and a flash promoter, the acidity of the mixture being sufficient to remove metal oxides contained on the articles to be plated and on a finely divided mechanical plating metal to be added, said flash promoter comprising per 100 square feet of plating surface area, up to about 400 grams of a strong acid or an acid engendering salt, from about 10 to about 80 grams of a soluble salt of a metal more noble than said plating metal, an effective amount of a dispersant capable of dispersing said plating metal, and an effective amount of an inhibitor capable of inhibiting corrosion of said plating metal;

(b) adding to said mixture said finely divided mechanical plating metal in sufficient quantity to effect a galvanomechanical deposition of said metal more noble than said plating metal;

(c) agitating the resultant mixture until said deposition is effected;

(d) adding to said mixture a portion of finely divided mechanical plating metal and an effective amount of a continuing promoter, said continuing promoter comprising, per pound of finely divided mechanical plating metal, from about 20 to about 150 grams of a strong acid or an acid engendering salt, from about 1.0 to about 20 grams of a soluble salt of a metal more noble than said plating metal, an effective amount of a dispersant capable of dispersing said plating metal, and an effective amount of an inhibitor capable of inhibiting corrosion of said plating metal;

(e) agitating said mixture for a sufficient time to effect mechanical plating of said finely divided plating metal on said metallic articles; and

(f) repeating steps (d) and (e) until said heavy, thick metallic coating is obtained on said metallic articles.

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**4,389,432**

## METHOD OF IMPROVING ADHESION AND ADHESION IMPROVERS USED THEREFOR

**Yoshio Inoue, and Hisashi Shimizu, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Jun. 8, 1982, Ser. No. 386,230**

**Claims priority, application Japan, Jun. 17, 1981, 56-92352**

**Int. Cl.³ B05D** *1/36;* **C08L** *31/02*

**U.S. Cl. 427—299** **8 Claims**

1. An adhesion improver which comprises

(a) 100 parts by weight of a copolymer formed of

(a-1) an organosilicon compound having at least one hydrolyzable atom or group bonded to the silicon atom and at least one ethylenic double bond in a molecule,

(a-2) glycidyl methacrylate, and

(a-3) an organic monomer having an ethylenic unsaturation; and

(b) from 1.0 to 40.0 parts by weight of a reaction product formed by the reaction of

(b-1) an organosilane compound having an aminoalkyl group as represented by the general formula

$$H\text{-}(\text{-}NH\text{—}CH_2\text{—}CH_2\text{-})_m NH\text{-}(\text{-}CH_2\text{-})_n Si(R)_a(X)_{3-a}$$

in which R is a monovalent hydrocarbon group having from 1 to 6 carbon atoms, X is a hydrolyzable group, m is zero, 1 or 2, n is 1, 2 or 3 and a is zero, 1 or 2, and

(b-2) an acid anhydride having at least three carbon atoms in a molecule.

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**4,389,433**

## SULFUR DIOXIDE CURED COATINGS

**Thomas R. Pampalone, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 212,810, Dec. 4, 1980, abandoned. This application May 6, 1981, Ser. No. 261,017**

**Int. Cl.³ B05D** *3/04, 3/10*

**U.S. Cl. 427—341** **14 Claims**

1. A method of forming a film on a substrate consisting essentially of applying to the substrate a nonaqueous composi-

tion comprising a solution of a free radical initiator having a hydroperoxide moiety in a liquid monomer containing one or more acrylate moieties and curing said composition by exposing same to sulfur dioxide gas.

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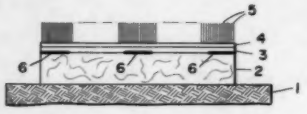
**4,389,434**

## PERMEABLE GRASS-LIKE SPORT SURFACE WITH FUSED GLASS MEMBRANE

**Herman A. Polman, Fijnaart, Netherlands, assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Feb. 12, 1982, Ser. No. 348,385**
**Int. Cl.³ E01C 7/00**
**U.S. Cl. 428—17** **9 Claims**




1. A water-permeable, grass-like sport surface comprising:
(a) a solid, porous, resilient base mat, formed from rubber or rubber-like particles bonded together by binder;
(b) a thermoplastic, synthetic fiber, grass-like mat placed over the base mat, said grass-like mat having been prepared by tufting the synthetic fibers into a fabric to obtain a fabric having loops of the synthetic fibers on the fabric's bottom side and a grass-like pile on its top side, placing on the loops on the bottom side of the fabric a water-permeable, heat-resistant membrane, composed of glass fibers or high melting-point fibers or a mixture of high melting-point fibers and glass fibers, followed by heating the membrane to thereby fuse the synthetic fibers to the membrane; and
(c) a discontinuous adhesive to attach the grass-like mat to the base mat.

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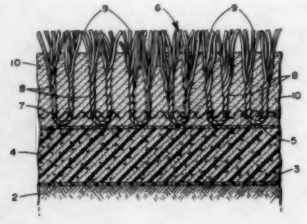
**4,389,435**

## TOP DRESSED PLATING SURFACE WITH RESILIENT UNDERPAD

**Frederick T. Haas, Jr., Metairie, La., assignor to Mod-Sod Sports Surfaces, Inc., Metairie, La.**

**Continuation of Ser. No. 115,141, Jan. 24, 1980, abandoned, which is a division of Ser. No. 947,036, Sep. 29, 1978, abandoned. This application Aug. 25, 1981, Ser. No. 296,128**
**Int. Cl.³ D03D 27/00; D04H 11/00**
**U.S. Cl. 428—17** **18 Claims**




1. A golf green comprising:
(a) a firm, stable subsurface;
(b) a resilient, compressible underpad from ¼ to 1¼" thick and having a density from about 3.5 to 12 lbs. per cubic foot;
(c) a pile fabric having a flexible backing and normally upstanding pile elements resembling grass; the length of said pile elements being substantially uniform and lying in the range from ½ to 1½"; and
(d) a compacted top dressing layer of sand having a particle size in the range from 10 to 200 U.S. screen mesh interspersed among the pile elements and on the backing to a substantially uniform depth at least ½ the length of the pile elements;
the combination of subsurface, underpad, pile fabric and top dressing providing natural footing for players and facilitating ball control by dissipating the shock of objects impacting on the surface.

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**4,389,436**

## FLEXIBLE FILM LAMINATE AND RETORTABLE FOOD POUCH THEREFROM

**Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 28, 1981, Ser. No. 334,763**
**Int. Cl.³ B65D 73/00, 1/00; B32B 27/08**
**U.S. Cl. 428—35** **15 Claims**

1. A flexible film laminate which comprises:
(a) a first layer of heat-sealable polyolefin film;
(b) a syndiotactic poly-1,2-butadiene adhesive bonding said first layer to;
(c) a second layer of polyacrylonitrile homopolymer film; said laminate having been subjected to conditions sufficient to effect the generation of free radicals in the system to an extent resulting in a greater bond strength between layers than in the absence of said conditions.

15. The retortable food pouch fabricated from a flexible film laminate which comprises:
(a) a first layer of heat-sealable polyolefin film;
(b) a syndiotactic poly-1,2-butadiene adhesive bonding said first layer to;
(c) a second layer of polyacrylonitrile homopolymer film; said laminate having been subjected to conditions sufficient to effect the generation of free radicals in the system to an extent resulting in a greater bond strength between layers than in the absence of said conditions.

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**4,389,437**

## BOIL RESISTANT FILM LAMINATE AND RETORTABLE FOOD POUCH THEREFROM

**Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 28, 1981, Ser. No. 334,764**
**Int. Cl.³ B65D 89/00; B32B 27/40, 27/32**
**U.S. Cl. 428—35** **9 Claims**

1. A flexible film laminate comprising:
(a) a first layer of a heat-sealable polyolefin film;
(b) a first adhesive layer contacting said polyolefin film; said first adhesive being a maleic acid anhydride adduct of an ethylene-propylene copolymer;
(c) a second adhesive layer contacting said first adhesive layer, said second adhesive being a combination of a styrene-butadiene block copolymer and a random terpolymer of from about 30 to about 40 parts by weight of 1,3-pentadiene; about 30 to about 40 parts by weight of a monocyclic terpene; and from about 25 to about 33 parts by weight of alpha methylstyrene, said combination consisting of from about 1 to about 3 parts by weight of the block copolymer to from about 3 to about 1 parts by weight of the terpolymer, said second adhesive also contacting;
(d) a second layer of a polyacrylonitrile homopolymer film; said laminate having been subjected to ultra violet radiation through said second layer to an extent resulting in a greater bond strength between layers than in the absence of said radiation.

4,389,438

## PROCESS FOR PREPARING LAMINATES

Akira Ohtsuki; Hirokichi Ishino; Hiromu Saksi; Takahiko Yamasoba; Susumu Tsuchiko, and Takashi Yoshino, all of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1981, Ser. No. 282,343
Claims priority, application Japan, Jul. 22, 1980, 55-99425
Int. Cl.³ B65D 37/00
U.S. Cl. 428—35 20 Claims

1. A process for preparing a final laminate comprising the steps of:

putting a thermoplastic resin sheet or film and a metal foil or sheet one upon another with a specific polyolefin type resin being interposed therebetween, the specific polyolefin type resin being at least one member selected from the group consisting of carboxyl group-containing polyolefin resins and metal compound-added carboxyl group-containing polyolefin resins,

heating the thus interposed specific polyolefin type resin through the metal foil or sheet to a temperature not lower than the melting point of the specific polyolefin type resin to obtain an intermediate laminate and

laminating at least one member selected from the group consisting of paper and thermoplastic sheets or films, on the metal foil or sheet side of said intermediate laminate using therebetween an ordinary adhesive which does not require to be heated to a temperature not lower than the melting point of said specific polyolefin type resin at the time of lamination, thereby to obtain a final laminate.

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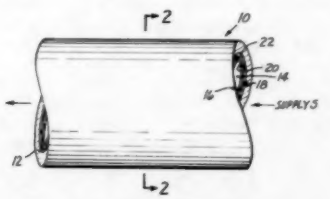
4,389,439

## EROSION RESISTANT TUBULAR APPARATUS FOR HANDLING SLURRIES

Eugene V. Clark, Northridge, and George K. Sievers, Burbank, both of Calif., assignors to Turbine Metal Technology, Inc., Burbank, Calif.

Filed Jul. 2, 1981, Ser. No. 279,827
Int. Cl.³ B05D 7/22; B32C 1/08
U.S. Cl. 428—36 23 Claims



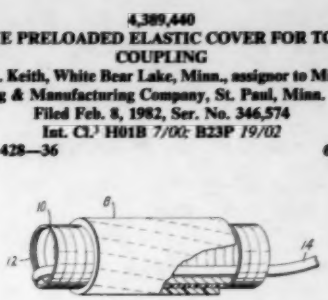

1. Fluid handling system comprising a supply of a finely particulate slurry free of gross particulate and of a highly erosive composition, and tubular apparatus conveying said slurry from said supply along a predetermined path extending from said supply, said apparatus comprising a steel wall of elongated tubular configuration defining an interior surface confining said slurries on said predetermined path, said surface tending to erode through passing contact with said composition, and an erosion resistant diffusion coating on said surface having an inner layer comprising intimately dispersed iron carbide and an outer layer consisting essentially of iron boride, in erosion blocking relation during conveyance of said slurry through said tubular apparatus.

4,389,440

## TORQUE PRELOADED ELASTIC COVER FOR TORQUE COUPLING

Roger H. Keith, White Bear Lake, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1982, Ser. No. 346,574
Int. Cl.³ H01B 7/00; B23P 19/02
U.S. Cl. 428—36 6 Claims




1. An elastic cover assembly for couplings or splices completed by rotational movement between the members comprising an elastic tubular cover member having an axial twist formed between the ends of the member with said member supported in a radially stretched condition on a hollow core member comprising a tough flexible material formed as a substantially rigid tube which can be collapsed and removed, allowing the cover to relax tightly about a coupling or splice without loss of the twist.

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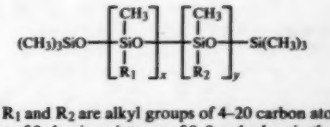
4,389,441

## HIGH DENSITY INFORMATION RECORD LUBRICANTS

Pabitra Datta, Cranbury; Eugene S. Poliniak, Willingboro, and Vladimir S. Ban, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

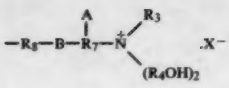
Filed Feb. 1, 1982, Ser. No. 344,552
Int. Cl.³ B32B 3/02; G11B 5/74
U.S. Cl. 428—65 3 Claims

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record being coated with a methyl alkyl siloxane lubricant having the formula

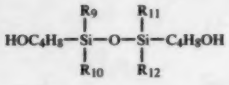



wherein $R_1$ and $R_2$ are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x and y is 4 or less, the improvement which comprises adding to said lubricant at least two dopants, at least one of which is selected from the following three classes having the formulas

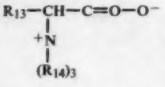
wherein $R_3$ is hydrogen, lower alkyl or hydroxyalkyl; $R_4$ is $R_6A$ wherein $R_6$ is an alkyl group of 1–5 carbon atoms and A is hydroxyl or carboxyl; $R_5$ can be $R_7A$ wherein $R_7$ is a straight chain alkyl group of 1–10 carbon atoms and A has the meaning given above or can be $R_7A$-B-$R_8$ wherein $R_7$ and A have the above meaning, B is a linking group which can be —O— or —C=C— and $R_8$ is an alkyl group of 6–25 carbon atoms, or their corresponding ammonium salt of the formula



wherein $R_7$, $R_8$, A and B have the above meanings and X can be an anion;



wherein $R_9$ and $R_{11}$ can be methyl or ethyl and $R_{10}$ and $R_{12}$ are long chain alkyl groups of up to 20 carbon atoms; and



wherein $R_{13}$ is an alkyl group of 10–20 carbon atoms and $R_{14}$ is an alkyl group of 1–5 carbon atoms wherein said second dopant is of a different dopant class.

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**4,389,442**

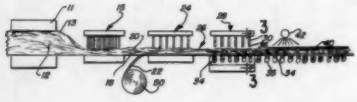
**WALL COVERING FABRIC WITH TEXTURIZED LOOPS**

**Robert C. Pickens, Jr., Gurnee; Patricia R. Kirchherr, Wonder Lake, and Reese R. Thomas, Libertyville, all of Ill., assignors to Ozite Corporation, Libertyville, Ill.**

**Continuation of Ser. No. 159,471, Jun. 16, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,648**

**Int. Cl.³ B32B** *3/02, 33/00*

**U.S. Cl. 428—92** **9 Claims**



1. A fabric comprising:

a needled batt of non-woven staple fibers,

a cloth or film of woven, knitted or extruded film needled punched to a face surface of said batt, and

texturized loops of staple fibers are formed from the staple fibers of said batt and extend from said batt outwardly through said cloth or film,

the texturized loops of fibers are comprised of a plurality of clusters of loops of fibers with each cluster containing a plurality of different sized loops of fibers,

said clusters of loops are formed in a pattern on said cloth or film with spaces between selected clusters of loops through which spaces said cloth or film is visible.

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**4,389,443**

**CUT PILE FABRIC WITH FUSED CARRIER AND METHOD OF MAKING SAME**

**Reese R. Thomas, Libertyville; John W. Ellicson, McHenry, and Ronald Somerville, Gurnee, all of Ill., assignors to Ozite Corporation, Libertyville, Ill.**

**Continuation of Ser. No. 159,473, Jun. 16, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,649**

**Int. Cl.³ B32B** *3/02, 33/00*

**U.S. Cl. 428—92** **7 Claims**

1. A cut pile fabric comprising:

a needled batt of non-woven staple fibers,

a carrier member fused on one surface of said batt from said staple fibers,

a plurality of texturized loops of staple fibers pushed from said batt and extending upwardly through the fused carrier member,

the texturized loops of fibers comprising a plurality of clusters

of loops of staple fibers with each cluster containing a plurality of different sized loops of staple fibers,

means formed on the other surface of said batt for backing said batt and for securing the staple fibers of said texturized loops and of said batt to said batt, and

a substantial portion of said texturized loops being cut to form cut pile.

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**4,389,444**

**NOVEL ALLOY COMPOSITIONS AND PRODUCTS**

**Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Division of Ser. No. 142,692, May 5, 1980, Pat. No. 4,301,255, which is a continuation-in-part of Ser. No. 54,540, Jul. 5, 1979, abandoned. This application Apr. 14, 1981, Ser. No. 254,225**

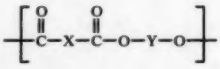
**Int. Cl.³ B32B** *3/10*

**U.S. Cl. 428—137** **3 Claims**

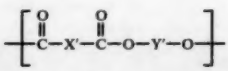
1. A permanently heat-shaped reticular web which comprises strands intersecting in a pattern and defining a corresponding pattern of holes, said web being formed from an alloy composition comprising

(a) from about 5 to 95 parts by weight of a thermoplastic-elastomeric block copolymer component, wherein the block copolymer is an A-B-A or A-B block copolymer or a mixture thereof in which A represents an alkenylarene polymer block and B represents a polymer block of a conjugated lower aliphatic diene, and

(b) correspondingly from about 95 to 5 parts by weight of a copolyester component, wherein the copolyester is a polymeric ester of at least two different ester units, each ester unit being a condensation product of a dicarboxylic acid and an aliphatic diol, said ester units being represented by the formulas



and



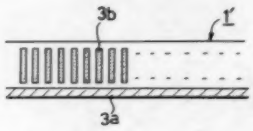
wherein X and X' are nuclei of dicarboxylic acids and Y and Y' are nuclei of aliphatic diols, and the copolyester is characterized by having a thermal softening temperature below about 225° C.

4,389,445

## DATA RECORDING SHEET

Masafumi Yoshida, and Kenichi Nakamura, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,836
Claims priority, application Japan, Jul. 10, 1978, 53/83008
Int. Cl.³ B32B 3/02, 7/02; H01L 41/08, 41/18
U.S. Cl. 428—77 10 Claims




1. In a data recording sheet in which data signals are stored in a polarizable macromolecular material sheet layer having a different polarization locally in the direction of the surface of said sheet layer, said sheet layer causing pyroelectric or pizeoelectric polarization through polarization operation, and said data signals thus stored are reproduced in a pyroelectric or piezo-electric mode, the improvement comprising: a macromolecular substrate layer, a thin intermediate electrode layer adjacent said substrate layer and said polarizable macromolecular material sheet layer adjacent to said intermediate electrode layer and laminated through said thin intermediate electrode layer on to said macromolecular substrate layer, said substrate layer having a Young's modulus greater than that of said sheet layer.

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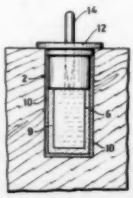
4,389,446

## LIQUID ABSORBING FIBROUS MATERIAL TREATED WITH A WOOD PRESERVATIVE AGENT

Cornelis W. Blom, Sassenheim, and Jacobus M. van Keulen, Bilthoven, both of Netherlands, assignors to Woodcap, B.V., Netherlands

Division of Ser. No. 889,977, Mar. 24, 1978, Pat. No. 4,265,958.
This application Mar. 13, 1981, Ser. No. 243,474
Claims priority, application Netherlands, Mar. 29, 1977, 7703412
Int. Cl.³ A01N 9/02, 17/10, 9/30; B32B 21/04
U.S. Cl. 428—166 6 Claims



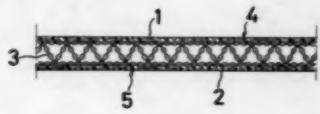

1. A liquid absorbing fibrous material provided with a sealed covering and having absorbed a composition for treating wood with a wood preservative agent in liquid or paste-like form comprising a liquid water expelling agent in an amount of at least 5%, biocide and water expelling agent.

4,389,447

## DIMENSIONALLY STABLE COMPOSITE MATERIAL AND PROCESS FOR THE MANUFACTURE THEREOF

Dieter Disselbeck, Bad Soden am Taunus, and Dieter Stahl, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 12, 1982, Ser. No. 338,856
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101022
Int. Cl.³ B32B 3/12
U.S. Cl. 428—178 8 Claims




1. Dimensionally stable composite material consisting substantially of a double fabric having a face fabric and a back fabric linked to each other by rigid spacer filaments, and provided on outsides of both the face fabric and the back fabric with a plastics layer, wherein the filaments linking the face fabric and the back fabric of the double fabric are rigid monofilaments permitting the double fabric to withstand compressive forces substantially without deformation, and wherein said plastics layer is a cured laminate.

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4,389,448

## PATTERNED DRYER ADDED FABRIC CONDITIONING ARTICLES

Donald L. Green, Forest Lakes, N.J., assignor to Beecham Products, Parsippany, N.J.

Continuation of Ser. No. 208,950, Nov. 21, 1980, abandoned.
This application Jul. 8, 1982, Ser. No. 396,458
Int. Cl.³ B32B 3/00
U.S. Cl. 428—195 44 Claims

1. An article useful for conditioning clothes in an automatic laundry dryer during the drying cycle, which article comprises a flexible polyurethane foam substrate impregnated with an effective amount of a conditioning agent and having on at least one surface thereof a pattern imprinted with an ink which adheres to the substrate, said ink being stable to the conditioning agent and stable during the impregnation of the substrate with the conditioning agent, or the ink is applied to the substrate after it has been impregnated, the ink pattern substantially disappearing from the substrate during the drying cycle.

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4,389,449

## CARBON FILM

Ulrich Kohle, Tiefenauweg 17, D-3167 Burgdorf, and Hans Paffhausen, Tiergartenstrasse 17 A, D-3000 Hannover, both of Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 219,090
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951618
Int. Cl.³ B32B 3/00, 5/16; B41M 3/10; B41L 1/16
U.S. Cl. 428—203 3 Claims

1. Carbon film, consisting of a transparent plastic film as base, a coloring carbon layer and a thin intervening layer located between the base and the carbon layer, wherein the intervening layer contains synthetic lustrous pigments.

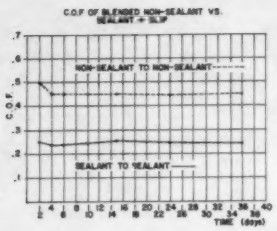
3. Carbon film according to claim 1 or 2, wherein a plastic film printed before application of the carbon layer and the intervening layer is used as the base.

4,389,450

## MULTIPLE LAYER PACKAGING FILM

Suzanne E. Schaefer, Neenah, and Jack E. Knott, II, Appleton, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 26, 1981, Ser. No. 238,210
Int. Cl.³ B32B 7/02; C09J 7/02
U.S. Cl. 428—212 12 Claims




1. A multiple layer heat sealable packaging sheet structure comprising: on one side thereof, a sealant layer; and on the other side thereof, a non-sealant layer, said sealant and non-sealant layers being heat sealable each to themselves and to each other; said non-sealant layer being a blend of about 25 percent to about 75 percent of a first base polymeric material which, in unblended composition, has a coefficient of friction of less than about 2, and about 75 percent to about 25 percent of a second blended-in tacky additive polymeric material which, in unblended composition, has a coefficient of friction greater than 2; said sealant layer being a blend of a tacky heat sealable polymer and up to about 25 percent of a slip additive.

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4,389,451

## ELECTROSTATIC RECORD MATERIAL

Hironari Fujioka, Takatsuki, and Hajime Matsubayashi, Akashi, both of Japan, assignors to Kanzaki Paper Manufacturing Company, Ltd., Japan

Filed Feb. 3, 1982, Ser. No. 345,366
Claims priority, application Japan, Feb. 13, 1981, 56-20322
Int. Cl.³ B32B 7/02; G01D 15/06
U.S. Cl. 428—212 3 Claims

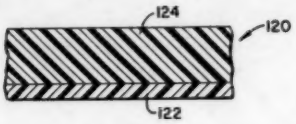
1. An electrostatic record material comprising an electroconductive base sheet and a record layer formed on the base sheet and composed mainly of insulating resin, the record material being characterized in that the electroconductive base sheet has an electroconductive layer comprising (1) electron conductive particles produced by coating the particles of an inorganic compound with an electroconductive substance consisting of stannic oxide and 0.1 to 20 percent by weight of antimony, the electron conductive particles having a specific resistivity of $10^{-2}$ to $10^{3}$ ohm. cm. at a pressure of 150 kg/cm$^2$ and (2) a water-soluble adhesive composed of salts of a copolymer of at least 20 mole % of acrylic acid or methacrylic acid monomer, the amount of the water-soluble adhesive being 3 to 100 parts by weight per 100 parts by weight of the electron conductive particles.

4,389,452

## TRANSPARENT INFRARED RADIATION ABSORPTION SYSTEM

Day Chahroudi, Placitas, N. Mex., and John R. Brookes, Berkeley, Calif., assignors to The Southwall Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 870,396, Jan. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 680,262, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 471,767, May 20, 1974, Pat. No. 3,953,110. This application Apr. 9, 1980, Ser. No. 138,784
Int. Cl.³ B32B 7/02, 9/04
U.S. Cl. 428—215 5 Claims




1. Apparatus for minimizing the transmission of long wave infrared energy without significantly affecting the transmission of solar energy to provide an energy efficient building component, such apparatus comprising:

a flexible plastic substrate of sheet material having a thickness of no more than approximately 20 mils; and

sheet means secured to said substrate for absorbing long-wave infrared radiation, said absorbing means including an oxide coating absorptive to long wave infrared radiation and having a thickness of between 0.01 and 50 microns, the sheet material of said substrate with said sheet means having adjacent faces in engagement with each other throughout substantially the entire surface areas of said faces;

said substrate and said absorbing means in combination being at least 94% transmissive to visible and other solar radiation while absorbing sufficient long wave infrared radiation to prevent the transmission of at least 80% of all incident long wave infrared radiation.

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4,389,453

## REINFORCED POLYPHENYLENE SULFIDE MOLDED BOARD, PRINTED CIRCUIT BOARD INCLUDING THIS MOLDED BOARD AND PROCESS FOR PREPARATION THEREOF

Minoru Kitanaka, Nagoya, and Yukichi Deguchi, Otsu, both of Japan, assignors to Toray Industries, Inc., Japan

Filed Jun. 7, 1982, Ser. No. 386,054
Int. Cl.³ B32B 5/16
U.S. Cl. 428—240 24 Claims

8. A printed circuit board comprising as an insulating substrate a reinforced polyphenylene sulfide molded board comprising 20 to 85% by weight of polyphenylene sulfide having a degree of crystallinity of at least 40% and 15 to 80% by weight of glass fibers having a length of at least 5 mm, and a metallic foil bonded to the surface of the substrate.

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4,389,454

## MOLDED FOAMED POLYURETHANE PART HAVING A LIGHTWEIGHT SKIN AND A PROCESS FOR ITS MANUFACTURE

Heinrich Horacek, Ludwigshafen; Matthias Marx, Bad Durkheim, and Dietmar Hobein, Neu-Estingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,060
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014161
Int. Cl.³ B29D 27/04
U.S. Cl. 428—318.6 12 Claims

1. A process for the preparation of molded parts having a

lightfast polyurethane skin and a polyurethane foam core comprising

A. applying a mixture of the following ingredients, which are reacted in one stage, to the inside wall of an open mold in an amount sufficient to form a skin for the molded part:

(1) an organic polyisocyanate, selected from the group consisting of an aliphatic, cycloaliphatic, and a urethane, biuret, or isocyanurate group containing aliphatic or cycloaliphatic polyisocyanate

(2) a polyol having a molecular weight of 1000 to 8000,

(3) an aliphatic primary or secondary diamine,

(4) chain extender, other than c, having a molecular weight of 60 to 600, selected from the group consisting of dialkanolamines, trialkanolamines, aliphatic diols and triols having 2 to 6 carbon atoms, and hydroxyl group-containing polyalkylene oxides based on ethylene oxide and/or propylene oxide and an initiator, and

(5) a catalyst; and

B. filling the mold with a formable polyurethane reaction mixture;

C. foaming and curing the foamed composite resin product and subsequently removing it from the mold.

12. A molded polyurethane part prepared in accordance with claim 1.

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**4,389,455**

## PHOTOGRAPHIC RESIN COATED PAPER

**Yasuzi Asao, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanatawa, Japan**

**Filed Aug. 21, 1981, Ser. No. 294,867**

**Int. Cl.³ B32B** *5/16, 27/10, 27/20*

**U.S. Cl. 428—328** **9 Claims**

1. A photographic printing paper, comprising:

a base paper sheet; and

a coating on said base paper sheet, wherein said coating is comprised of a polyolefin resin containing particles of titanium oxide pigment wherein surfaces of said particles are coated with a polyhydric alcohol selected from the group consisting of dihydric alcohols, trihydric alcohols, or tetrahydric alcohols.

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**4,389,456**

## STABILIZED FINISH COMPOSITION

**Robert M. Marshall, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Oct. 30, 1981, Ser. No. 316,584**

**Int. Cl.³ D02G** *3/00*

**U.S. Cl. 428—375** **49 Claims**

1. An oil-in-water yarn finish composition, the nonaqueous portion of which comprises:

(a) about 0.25 to 10 weight percent of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid; and

(b) the balance comprising:

about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups; about 15 to 28 weight percent of polyoxyalkylene castor oil; about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof; about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and mixtures thereof; and about 1 to 5 weight percent of a suitable antioxidant.

33. In a process for the production of synthetic polymer yarn, the improvement which comprises: treating the yarn with a sufficient amount of an oil-in-water yarn finish composition to achieve a total oil on yarn of 0.1 to 2.0 weight percent, the nonaqueous portion of the composition comprising:

(a) about 0.25 to 10 weight percent of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid; and

(b) the balance comprising: about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups; about 15 to 28 weight percent of polyoxyalkylene castor oil; about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof;

about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and mixtures thereof; and about 1 to 5 weight percent of a suitable antioxidant.

39. A method for improving the emulsion stability of an oil-in-water yarn finish composition by adding thereto the nonaqueous portion which comprises:

about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups, said lubricant including about 10 to 90 percent lauric oil and about 10 to 90 percent oleic oil;

about 15 to 28 weight percent of polyoxyalkylene castor oil;

about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof;

about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and mixtures thereof; and

about 1 to 5 weight percent of a suitable antioxidant; said method comprising:

adding about 0.25 to 10 percent, based on the weight of the final nonaqueous portion of the composition, of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid.

4,389,457

## HOT-MELT POLYESTERIMIDE-POLYISOCYANATE ELECTRICAL COATING COMPOSITIONS

Denis R. Pauze, Scotia, and Otto S. Zamek, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 154,838, May 30, 1980, Pat. No. 4,296,229.
This application Jul. 14, 1981, Ser. No. 283,134
Int. Cl.³ C08G *18/80, 18/42;* C08F *283/04*
U.S. Cl. 428—379 6 Claims

1. An electrical conductor provided with a coating of a composition comprising a resinous reaction product obtained by heating ingredients comprising:

(a) an aromatic diamine;

(b) an aromatic carboxylic anhydride containing at least one additional carboxylic group;

(c) terephthalic acid or a reactive derivative thereof;

(d) a polyhydric alcohol having at least three hydroxyl groups;

(e) an alkylene glycol; and

(f) a small amount of

(i) an alkylene glycol monoether or monoester;

(ii) a polyalkylene glycol monoether or monoester; or

(iii) a mixture of (i) and (ii),

until an acid number of lower than about 6 to about 7 is attained, and adding to the hot reaction product a blocked polyisocyanate in an amount of from about 1 to about 40 parts by weight per 100 parts by weight of the polyesterimide and blocked polyisocyanate.

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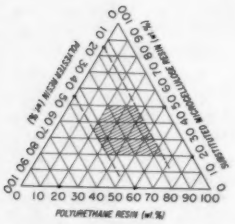
4,389,458

## MAGNETIC RECORDING MEDIUM

Akihiko Hosaka, and Kiyotaka Okuyama, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,053
Claims priority, application Japan, Mar. 26, 1981, 56-43184
Int. Cl.³ B32B *27/28, 27/30, 27/36, 27/40*
U.S. Cl. 428—425.9 2 Claims




1. In a magnetic recording medium having a substrate coated with a magnetic layer comprising a magnetic powder and a binder, the improvement characterized in that said binder in said magnetic layer comprises 20 to 60 wt.% of a polyurethane, 15 to 45 wt.% of a polyester resin and 20 to 50 wt.% of a vinyl chloride-vinyl acetate copolymer-impregnated nitrocellulose.

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4,389,459

## CONDUCTIVE COATINGS FOR METAL SUBSTRATES

Michael J. Mirra, and Albert H. Giles, both of Greeneville, Tenn., assignors to Ball Corporation, Muncie, Ind.

Division of Ser. No. 147,004, May 6, 1980, Pat. No. 4,331,487.
This application Nov. 30, 1981, Ser. No. 325,691
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—457 3 Claims

1. A metal substrate treated by the process of contacting a metal surface with a solution containing 0.1 to 2.5 weight percent of a salt selected from the group consisting of iron nitrate, nickel nitrate and copper nitrate, 0.01 to 3.5 weight percent of an oxidizing agent selected from the group consisting of perborates, peroxides, persulfates and perchlorates, 2 to 20 weight percent of a mineral acid selected from the group consisting of sulfuric acid and phosphoric acid and the remainder water, drying the contacted surface and thereafter applying an electrically conductive coating thereon.

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4,389,460

## METHOD OF PROTECTING SUBMERGED ARTICLES AGAINST FOULING

François Dawans, Bougival; Marguerite Devaud, Mont St Aignan, and Denise Nicolas, Maurepas, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 935,822, Aug. 22, 1978, Pat. No. 4,262,097.
This application Nov. 19, 1980, Ser. No. 208,463
Claims priority, application France, Aug. 22, 1977, 77 25771
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—458 37 Claims

1. In a water-submersible article of manufacture protected against fouling by marine organisms by the application thereon of a surface coating of a biocidal coating composition,

the improvement wherein said biocidal coating composition comprises an anti-fouling amount of an organometallic polymer composition comprising a graft copolymer formed of:

(a) a main chain consisting of a chlorinated polymer of a conjugated diene monomer; and

(b) at least one grafted chain formed at least partly of recurrent units having at least one pendant tin or organotin carboxylate function;

wherein said chlorinated polymer of a conjugated diene monomer has a chlorine content such that the final graft copolymer contains from 20 to 65% by weight of chlorine.

19. In a method of treating an article to be submerged in water, to protect the article against fouling by marine organisms, comprising applying to the article a surface coating of a biocidal coating composition,

the improvement wherein said biocidal coating composition comprises an anti-fouling amount of an organometallic polymer composition comprising a graft copolymer formed of:

(a) a main chain consisting of a chlorinated polymer of a conjugated diene monomer; and

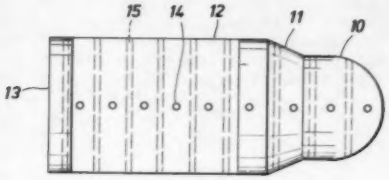
(b) at least one grafted chain formed at least partly of recurrent units having at least one pendant tin or organotin carboxylate function;

wherein said chlorinated polymer of a conjugated diene monomer has a chlorine content such that the final graft copolymer contains from 20 to 65% by weight of chlorine.

## 4,389,461
## PIPELINE PIG

Paul R. Scott, Brazoria, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 8, 1982, Ser. No. 356,011
Int. Cl.³ B32B 1/06; B05D 7/22
U.S. Cl. 428—543 10 Claims

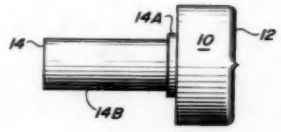



1. A pipeline pig comprising a cylindrically shaped body of polymeric foam having cells filled with a gel.

## 4,389,462
## PROCESS FOR ENCLOSING A PIN SHANK WITHIN AN ENCLOSING MEMBER AND ARTICLE PRODUCED THEREBY WHICH IS SUBSTANTIALLY DEVOID OF A GAP BETWEEN THE ENCLOSING MEMBER AND THE HEAD OF THE PIN

Paul J. Walsh, and Jeffrey A. Burkart, both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jul. 8, 1981, Ser. No. 281,541
Int. Cl.³ B32B 15/16
U.S. Cl. 428—564 14 Claims

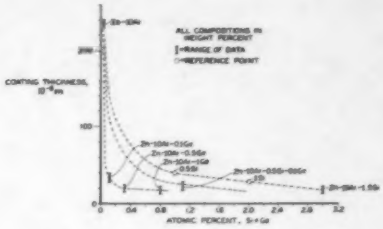



1. A process for enclosing a pin shank within an enclosing member, comprising the steps of: providing a pin having a head and a shank, the pin being formed from a metal, the cross-section of the head being larger than that of the shank in a direction normal to the length of the pin, and in the same direction, the cross-section of the shank being larger adjacent the head then over all other parts thereof, the larger cross-section of the shank being less than 30% of the length of the shank; providing an enclosing member, the enclosing member being of material dissimilar to that of the pin, the enclosing member being formed from material in powder form; inserting the shank into the enclosing member; and sintering the enclosing member, the enclosing member adhering to the shank during sintering, the enclosing member fitting up against the head so that the article is substantially devoid of a gap therebetween.

## 4,389,463
## ZINC-ALUMINUM HOT DIP COATED FERROUS ARTICLE

John G. Smeggil, Simsbury, and Norman S. Bornstein, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1981, Ser. No. 286,128
Int. Cl.³ C23C 1/02; C22C 18/04
U.S. Cl. 428—659 11 Claims




1. A ferrous metal article having on the surface thereof a hot dip coating comprised predominantly of zinc (Zn), up to 17 weight percent aluminum (Al), and at least 0.1 weight percent germanium (Ge).

## 4,389,464
## BLACK CHROME COATING FOR SOLAR COLLECTORS AND METHOD OF ELECTRODEPOSITING SAID COATING

August Mühlratzer, Gilching, Fed. Rep. of Germany, assignor to Man Maschinenf Abrik Augsburn-Nurnberg, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,210
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029637
Int. Cl.³ B32B 15/01; C25D 3/56, 5/12
U.S. Cl. 428—667 10 Claims

1. A black chrome electrolyte for the electrodeposition of selective layers for solar collectors, said black chrome electrolyte consisting essentially of chromium trioxide ($CrO_3$), fluorosilic acid ($H_2SiF_6$) as a catalyst and sodium molybdate ($Na_2MoO_4.2H_2O$), said black chrome electrolyte being adapted to form a thin, black layer, by electrodeposition, on a substrate.

9. A solar absorber comprising a substrate having a nickel surface, and an electrocoating on said nickel surface of said substrate comprising an electrodeposit from a black chrome electrolyte consisting essentially of chromium trioxide, fluorosilic acid and sodium molybdate.

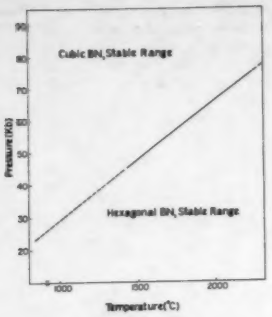
## 4,389,465
## SINTERED COMPACT FOR USE IN A TOOL AND THE METHOD FOR PRODUCING THE SAME

Tetsuo Nakai; Yuichiro Kono; Shuji Yaza, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 145,454, Apr. 25, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,663
Claims priority, application Japan, May 1, 1979, 54-53583
Int. Cl.³ C04B 35/58
U.S. Cl. 428—698 5 Claims

1. A sintered compact for use in an ultrahard tool consisting essentially of 20–80 volume % cubic boron nitride and the residual part consisting of $Al_2O_3$, said residual part constituting a continuous phase in the structure of the sintered compact,

characterized in that the half width of (116) in X-ray diffraction of CuKα ray of the $Al_2O_3$ crystals in the sintered compact




is within the range from 0.600 deg. to 0.200 deg., and the particle size of the cubic boron nitride is less than 5 μm.

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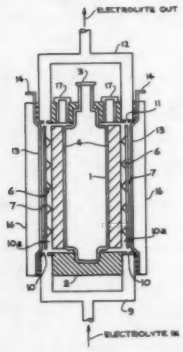
**4,389,466**

## RAPIDLY REFUELABLE FUEL CELL

**Richard W. Joy, Santa Clara, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jun. 3, 1981, Ser. No. 270,113**
**Int. Cl.³ H01M *8/02, 8/18***
**U.S. Cl. 429—27** **10 Claims**




1. A refuelable electrochemical fuel cell comprising:

a housing defining a chamber therein and having a removable cover,

at least one air-cathode positioned within said chamber of said housing,

an expandable and contractable member positioned within said chamber of said housing,

at least one consumable reactive metal anode movably positioned within said chamber of said housing and located intermediate said member and said air-cathode, said consumable anode having a sheet-like configuration and positioned in said chamber such that a peripheral edge of said anode is adjacent said removable cover of said housing,

current collector means positioned within said chamber of said housing and located intermediate said anode and said air-cathode,

means for directing electrolyte through said housing intermediate said anode and said air-cathode, and

means for causing expansion and contraction of said member, whereby expansion of said member applies an even pressure to said anode causing said anode to be moved toward said air-cathode and to maintain said anode in constant contact with said current collector means during consumption of said anode, and whereby contraction of said member allows placement of a new consumable anode in said housing via said removable cover.

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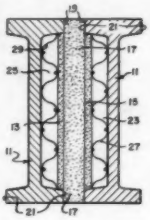
**4,389,467**

## POROUS ELECTROLYTE RETAINER FOR MOLTEN CARBONATE FUEL CELL

**Raj N. Singh, and Joseph T. Dusek, both of Downers Grove, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Continuation of Ser. No. 107,741, Dec. 27, 1979. This application Nov. 28, 1980, Ser. No. 211,001**
**Int. Cl.³ H01M *8/14***
**U.S. Cl. 429—41** **11 Claims**



1. In a fuel cell including a porous metal plate for use as an anode electrode, a porous plate containing a metal oxide for use as a cathode electrode, the electrode plates having porosities of about 65–75%, first and second channel means for providing a fuel gas to the anode and an oxidant gas to the cathode respectively and a porous $LiAlO_2$ tile intermediate said cathode and ancde plates, the improvement wherein said $LiAlO_2$ tile is a structurally stable plate of more than 50% porosity but of a porosity near to but below that of the electrode plates, said porous $LiAlO_2$ tile having particles consisting essentially of gamma $LiAlO_2$ bonded together at points of contact by mutual diffusion at sintering conditions.

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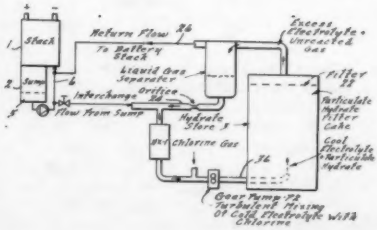
**4,389,468**

## METAL HALOGEN BATTERY SYSTEM WITH MULTIPLE OUTLET NOZZLE FOR HYDRATE

**Harry K. Bjorkman, Jr., Birmingham, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.**

**Filed Mar. 16, 1982, Ser. No. 358,628**
**Int. Cl.³ H01M *2/40***
**U.S. Cl. 429—70** **5 Claims**




1. In a metal halogen battery system, including at least one cell having a positive electrode and a negative electrode contacted by aqueous electrolyte containing the material of said metal and halogen, store means whereby halogen hydrate is formed and stored as part of an aqueous material, means for

circulating electrolyte through the cell and to the store means, and conduit means for transmitting halogen gas formed in the cell to a hydrate former whereby the hydrate is formed in association with the store means, said store means being constructed in the form of a container which includes a filter means, said filter means being operative to separate the hydrate formed from the electrolyte,

the improvement comprising,

a hydrate former pump means associated with the store means and being operative to intermix halogen gas with aqueous electrolyte to form halogen hydrate,

said hydrate former means including,

multiple outlet nozzle means connected with the outlet side of said pump means and being operative to minimize plugging,

said nozzle means being comprised of at least one divider means which is generally perpendicular to rotational axes of gears within the pump means, said divider means acting to divide the flow from the pump means into multiple outlet flow paths.

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**4,389,469**

## ELECTRICAL POWER PACKS AND CHARGING DEVICES

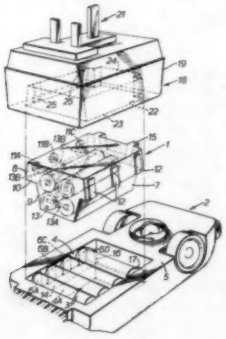
**Bryan F. Nicholls, Kingsley, England, assignor to The Mettoy Company Limited, Northampton, England**

**Filed Oct. 2, 1981, Ser. No. 308,098**

**Claims priority, application United Kingdom, Oct. 10, 1980, 8032800; Jan. 9, 1981, 8100682**

**Int. Cl.³ H01M 2/10**

**U.S. Cl. 429—98** **16 Claims**



**1.** A power pack in combination with a battery operated device, the power pack comprising a casing, means for receiving rechargeable cells within the casing, power output terminals carried by the casing, and conductor means within the casing connecting the rechargeable cell terminals electrically to said output terminals, the casing being sealed permanently against removal of the rechargeable cells, said battery operated device comprising a base member including a recess having opposite sides, and pairs of opposed electrical power input terminals located on said opposite sides of the recess adapted for receiving individual conventional battery cells therebetween, the recess and power pack casing including complementary keying means for said recess to receive the power pack in place of said individual conventional battery cells in one predetermined orientation of said power pack relative to said recess, and said output terminals of the power pack engaging predetermined input terminals of the battery operated device with the power pack in the recess.

**4,389,470**

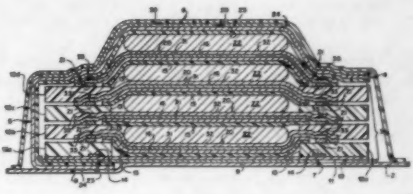
## LAMINAR CELLS AND BATTERIES

**Paul A. Plasse, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Aug. 24, 1981, Ser. No. 295,268**

**Int. Cl.³ H01M 6/46**

**U.S. Cl. 429—152** **5 Claims**



**1.** A battery comprising a stack of laminar cells terminated at one end by an end terminal formed with a pocket, said end terminal comprising an external metal collector sheet laminated to a sheet of conductive plastic confronting the cell components, said cells each comprising at least one electrode comprising a slurry of electrochemically active particles in an aqueous electrolyte, a second electrode, and a separator between said slurry electrode and said second electrode, in which at least the separator in the cell adjacent said pocketed end terminal comprises a layer of regenerated cellulose in contact with said second electrode and a layer of porous bibulous material over said regenerated cellulose layer and in contact with said slurry electrode to limit migration of electrolyte from said slurry electrode.

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**4,389,471**

## ELECTRIC STORAGE BATTERIES

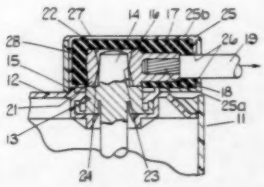
**John L. Woodhouse, Kingshurst, England, assignor to Lucas Industries Limited, Birmingham, England**

**Continuation-in-part of Ser. No. 102,309, Dec. 11, 1979, abandoned. This application Jan. 30, 1981, Ser. No. 230,085**

**Claims priority, application United Kingdom, Dec. 16, 1978, 48818/78; Dec. 16, 1978, 48819/78**

**Int. Cl.³ H01M 2/02**

**U.S. Cl. 429—178** **2 Claims**



**1.** A combination of an electric storage battery and a connector for making an electrical connection to the battery, wherein the connector includes a hollow conductive body having a bore therein mounted on and welded to a terminal of the battery and connected thereto by a weld, and a flexible conductive cable connected to and extending from the body, and wherein the bore in the body is non-complementary with the terminal and is shaped so that the wall thereof defines intermediate its ends a projecting portion which engages the terminal, the weld between the terminal and the conductive body being restricted to the region thereof between said projecting portion and the outer end of the bore, and the relative shaping of the bore and the terminal being such that a clearance is defined between the wall of the bore and the terminal in the region between the other end of the bore and said projecting portion.

## 4,389,472
## PROCESS FOR THE PRODUCTION OF DOCUMENTS WHICH CANNOT BE FALSIFIED

**Karl-Friedrich Neuhaus; Hans J. Rosenkranz, and Hermann Perrey, all of Krefeld, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 16, 1980, Ser. No. 216,852**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952322; Jul. 22, 1980, 3027759**

**Int. Cl.³ B32B *7/04*; G03C *1/87***

**U.S. Cl. 430—10** **24 Claims**

1. A tamper proof document which is proof against falsification, consisting of an information carrier comprised of a sheet having a photographic emulsion layer carrying information and laminated with at least one transparent foil on one or both sides, wherein the foil carries an adhesive layer containing a polymer hardened by radical cross-linking by high energy radiation or by initiators capable of being activated by UV light or by heat, or by accelerators

said adhesive layer bonding the foil to the surface of the information carrier photographic sheet in such a manner that the foil and sheet cannot be separated without destruction of the information carrier sheet and of the information contained in it.

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## 4,389,473
## PRODUCTION OF TRANSFER MATERIAL

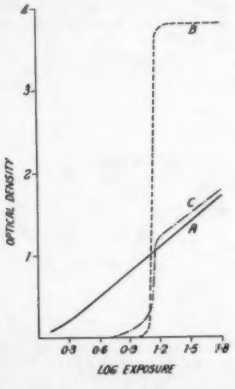
**Simon L. Scrutton, London; William F. G. Marwick, Sittingbourne, and David R. Wilson, Tadworth, all of England, assignors to Letraset USA, Inc., Bergenfield, N.J.**

**Division of Ser. No. 959,145, Nov. 9, 1978, Pat. No. 4,254,211, which is a continuation-in-part of Ser. No. 794,988, May 9, 1977, abandoned, and Ser. No. 795,420, May 9, 1977, abandoned. This application Nov. 3, 1980, Ser. No. 203,265**

**Claims priority, application United Kingdom, May 7, 1976, 18906/76**

**Int. Cl.³ G03C *5/00, 1/90***

**U.S. Cl. 430—17** **8 Claims**




1. The transfer material obtained by applying to a transparent or translucent substrate a coating layer which comprises a photosensitized composition of a homopolymer or copolymer of vinylacetate with polyvinyl alcohol or polyvinyl pyrrolidone the coating layer being insoluble but swellable in water and the ratio of said acetate constituent of the layer to said alcohol or pyrrolidone constituent of the layer being sufficiently high to render the layer insoluble in water prior to exposure and the adhesion of the coating layer to the substrate increasing on exposure to actinic light,

imagewise exposing the coating layer to actinic light through the substrate to increase the adhesion of the coating layer to the substrate in the exposed areas, and

developing the imagewise exposed coating layer by applying water to the coating layer to wash away those parts of the coating layer which have not been exposed and to retain substantially the original thickness of the coating layer in the areas which have been exposed.

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## 4,389,474
## THIOPYRYLIUM COMPOUNDS AND PHOTOCONDUCTIVE COMPOSITIONS CONTAINING SAID COMPOUNDS

**Kouichi Kawamura; Hideo Sato, and Harumi Katsuyama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

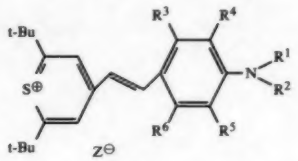
**Filed Aug. 20, 1981, Ser. No. 294,644**

**Claims priority, application Japan, Aug. 20, 1980, 55-114259**

**Int. Cl.³ G03G *5/04, 9/08***

**U.S. Cl. 430—37** **8 Claims**

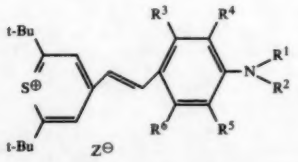
1. A photoconductive composition comprising (a) a thiopyrylium compound of the general formula (I)




(I)

wherein t-Bu represents a tertiary butyl group; $R^1$ and $R^2$, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a substituted alkyl group, an unsubstituted aryl group, or a substituted aryl group, with the proviso that both $R^1$ and $R^2$ are not both an alkyl group, $R^3$, $R^4$, $R^5$, and $R^6$, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms, or a halogen atom; and Z represents an anion and (b) a photoconductive material.

8. Photoconductive photosensitive particles used for a photoelectrophoresis electrophotographic process containing a thiopyrylium compound of the general formula (I)




(I)

wherein t-Bu represents a tertiary butyl group; $R^1$ and $R^2$, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a substituted alkyl group, an unsubstituted aryl group, or a substituted aryl group, with the proviso that both $R^1$ and $R^2$ are not both an alkyl group; $R^3$, $R^4$, $R^5$, and $R^6$, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms, or a halogen atom; and Z represents an anion.

## 4,389,475
## MULTILAYERED ELECTROPHOTOGRAPHIC RECORDING MEDIUM

**Gerhard Hoffmann, Otterstadt, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

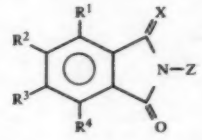
**Filed Mar. 16, 1982, Ser. No. 358,582**

**Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110958**

**Int. Cl.³ G03G 5/06**

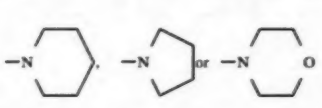
**U.S. Cl. 430—58** **7 Claims**

1. An electrophotographic recording medium which consists essentially of an electrically conductive base, a first layer containing charge carrier-producing dyes, and a second layer which is substantially transparent to actinic light and is composed of an insulating organic material containing at least one compound which is charge carrier-transporting when exposed to light, wherein the charge carrier-producing dye is of the formula I



(I)

where $R^1$, $R^2$, $R^3$ and $R^4$ are each hydrogen, halogen, methyl or methoxy, or one or two of the radicals $R^1$, $R^2$, $R^3$ and $R^4$ are $C_1$–$C_6$-alkyl, phenyl, phenoxy, phenylthio, nitro, amino N,N-$C_1$–$C_4$-dialkylamino, a radical of the formula



or a radical of the formula —NHCOR⁵, where $R^5$ is $C_1$–$C_6$-alkyl or unsubstituted or substituted phenyl, and the remaining radicals $R^1$, $R^2$, $R^3$ and $R^4$ are each hydrogen, X is the radical of a methylene-active compound or a radical of the formula =N-R⁶', where R⁶' is the radical of an aromatic or heterocyclic amine or hydrazine, and Z is hydrogen, methyl or phenyl.

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## 4,389,476
## BARRIER COAT FOR ELECTROSTATIC MASTER

**Michael J. Whalen-Shaw, Paw Paw, and Robert J. Thiessen, Richland, both of Mich., assignors to Allied Paper Incorporated, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 53,168, Jun. 29, 1979, Pat. No. 4,340,659, which is a continuation-in-part of Ser. No. 827,127, Aug. 24, 1977, abandoned. This application Oct. 27, 1981, Ser. No. 315,287**

**The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.**

**Int. Cl.³ G03C 5/00**

**U.S. Cl. 430—64** **14 Claims**

1. A method for the preparation of electrostatic masters having improved water and pick resistance for lithographic printing comprising the steps of

(a) applying to a base a barrier coat formulation which comprises an aqueous dispersion of a copolymer of at least about 60% ethylenically unsaturated polymerizable monomer having non-polar functionality and about 3% to about 40% of a polymerizable olefinically unsaturated monomer having polar functionality;

(b) drying the formed barrier coat; and

(c) applying to said barrier coat a photoconductive coating comprising a photoconductive material and binder.

## 4,389,477
## PHOTOCONDUCTIVE COMPOSITION SENSITIZED BY A THIOBARBITURIC ACID DERIVATIVE

**Syunichi Kondo; Hirotsugu Nomaguchi, and Hideo Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 21, 1981, Ser. No. 256,211**

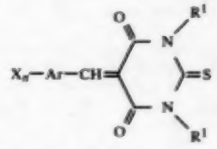
**Claims priority, application Japan, Apr. 22, 1980, 55/53125**

**Int. Cl.³ G03G 5/09**

**U.S. Cl. 430—81** **13 Claims**

1. A photoconductive composition comprising a mixture of a photoconductive substance and

a thiobarbituric acid derivative in a sensitizing amount represented by the formula (I):



(I)

wherein $R^1$ is an alkyl group containing 1 to 12 carbon atoms, an alkoxyl group containing 1 to 5 carbon atoms, or a phenyl group; X is a hydrogen atom, a halogen atom, a cyano group or a nitro group; Ar is a divalent, trivalent or tetravalent group derived from benzene, naphthalene, pyridine, furan or thiophene; and n is 1, 2 or 3, wherein the photoconductive substance is a polymer with a pi electron system in a main or side chain thereof.

6. An electrophotographic light-sensitive medium comprising

a support with an electrically conductive surface thereon and

a layer of the photoconductive composition as claimed in claims 1 or 2.

11. The electrophotographic light-sensitive medium as claimed in claim 6, wherein said photoconductive substance is a poly-N-vinyl carbazole or an N-vinyl carbazole copolymer.

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## 4,389,478
## APPARATUS FOR AND METHODS OF MAKING BIMODAL ELECTROPHOTOGRAPHIC COPIES

**Rudolph Guzik, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.**

**Continuation of Ser. No. 110,427, Jan. 7, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 275,882**

**Int. Cl.³ G03G 13/09, 13/22**

**U.S. Cl. 430—97** **4 Claims**

1. A bimodal electrophotographic process for printing black on white copy on a photosensitive layer of a single type of material coated on one side of a substrate from either a black on white or a white on black document comprising the steps of:

a. selectively applying a bias for a reversal mode and interchangeably therewith removing a bias for a positive mode of operation;

b. In the positive mode:

(i) electrostatically charging with a negative charge one surface of said photosensitive layer of said single type of coated material;

(ii) exposing the negatively charged surface to an image having light and dark areas for causing the negative charge to dissipate in varying degree depending on the amount of light in the exposure areas;

(iii) passing said coated material through a gap between a magnetic brush and a supporting structure containing an electrically insulating area adjacent the gap, whereby said insulation provides an area which does not have current flow capability;

(iv) applying a positively charged toner which is electrostatically attracted to the negatively charged surface,

said toner being applied via said magnetic brush while the opposite side of said substrate is electrically insulated in the area adjacent the gap for prohibiting a current through the substrate; and

(v) fusing the toner deposited on the photosensitive layer of the coated material; and

c. In the reversal mode:

(i) electrostatically charging with a positive charge said one surface of the photosensitive layer of the same single type of coated material;

(ii) exposing the positively charged surface to an image having light and dark areas for causing the positive charge to dissipate in varying degree depending on the amount of light in the exposure areas;

(iii) passing said coated material through said gap;

(iv) applying said positively charged toner which is electrostatically repelled from the positively charged surface, said toner being applied via said magnetic brush while said brush has a positive electrostatic bias applied thereto, and without causing a current through said substrate, while the opposite surface of said substrate is electrically insulated by the area adjacent the gap for prohibiting current flow from said magnetic brush to said opposite surface of said layer; and

(v) fusing the deposited toner to said surface of the photosensitive layer of the single type of coated material.

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**4,389,479**

## NEUTRALIZING LAYER FOR COLOR TRANSFER ASSEMBLAGES

**John F. Bishop, Rochester, and Wayne A. Bowman, Walworth, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 14, 1981, Ser. No. 263,523**

**Int. Cl.³ G03C** *1/40, 5/54, 1/78, 1/76*

**U.S. Cl. 430—216** **55 Claims**

**1.** In a photographic assemblage comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

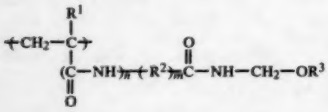
(b) a dye image-receiving layer;

(c) a neutralizing layer for neutralizing an alkaline processing composition; and

(d) a timing layer located between said neutralizing layer and said dye image-receiving layer so that said processing composition must first permeate said timing layer before contacting said neutralizing layer;

the improvement wherein said neutralizing layer comprises a cross-linked polymer derived from:

(i) 5 to 30 weight percent of recurring units which conform to the structure:



wherein

$R^1$ is hydrogen or methyl,

$R^2$ is alkylene, arylenealkylene, alkylenebisarylene, arylenebisalkylene or arylene,

$R^3$ is an alkyl group of 1 to about 10 carbon atoms, and n and m are 0 or 1 with the proviso that when m is 0, then n is 0, and when m is 1, then n is 0 or 1;

(ii) 30 to 80 weight percent of recurring units derived from a substituted or unsubstituted acrylic acid; and

(iii) 5 to 30 weight percent of recurring units derived from an alkyl acrylic ester wherein the alkyl group has from 1 to about 16 carbon atoms.

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**4,389,480**

## LIGHT-SENSITIVE LAYER TRANSFER MATERIAL

**Werner Franke, Wiesbaden, and Markus Seibel, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 972,817, Dec. 26, 1978, abandoned. This application Jan. 12, 1981, Ser. No. 224,230**

**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758575**

**Int. Cl.³ G03C** *5/04*

**U.S. Cl. 430—271** **1 Claim**

**1.** In a light-sensitive layer transfer material consisting essentially of a temporary film support and a negative-working light-sensitive thermoplastic photopolymerizable photoresist layer detachably connected therewith, the improvement that the adhesion of the upper side of the film support, which carries the light-sensitive layer, is increased with respect to that layer by treatment with an adhesive-promoting agent so that the adhesive difference between the upper side and the underside of the film support is at least 8 g/100 mm, and the adhesion of the upper side does not exceed 70 g/100 mm.

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**4,389,481**

## METHOD OF MAKING PLANAR THIN FILM TRANSISTORS, TRANSISTOR ARRAYS

**Michael Poleshuk, and Joseph J. Wysocki, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 2, 1980, Ser. No. 155,335**

**Int. Cl.³ H01L** *21/84*

**U.S. Cl. 430—319** **3 Claims**

**1.** A process of preparing a planar thin film transistor on a substrate by forming in sequential or in reverse sequential order layers **1**, **2**, **3** and **4** on the substrate which comprises:

forming layer **1** by depositing a gate electrode on a discrete area of a light transmitting substrate, said gate electrode having a given thickness;

depositing a photoresist material over the substrate and the gate electrode;

exposing the photoresist material through the substrate so that the gate electrode serves as a mask thereby eliminating the concern about photomask alignment;

removing the exposed photoresist material leaving the unexposed photoresist material covering the gate electrode;

depositing an insulating material on the substrate and the photoresist covered gate electrode to a depth substantially equal to the thickness of the gate electrode in the area unoccupied by the gate electrode;

removing the insulating material and photoresist material from the gate electrode by dissolution of the photoresist material so that the insulating material left on the substrate together with the gate electrode form a planar layer on the substrate of substantially uniform thickness;

forming layer **2** by depositing on said substantially planar surface of layer **1** a layer of insulating material having a substantially uniform thickness;

forming layer **3** by depositing on said uniform layer **2** of insulating material a layer of semiconducting material, said semiconducting material being in a discrete area in field effect transistor positional relationship with said gate electrode, depositing an insulating material on said uniform layer of insulating material in the areas unoccupied by said semiconducting material to a depth substantially equal to the thickness of the semiconducting material, to form a substantially planar surface of uniform thickness; and

forming layer **4** by depositing on said substantially planar surface of layer **3** in discrete areas thereof a source elec-

trode and a drain electrode, said source electrode and drain electrode being in field effect transistor positional relationship with respect to said semiconducting material, and depositing an insulating material on said substantially planar surface of layer 3 in the areas unoccupied by said source and drain electrodes to a depth substantially equal to the thickness of the source electrode and drain electrode.

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**4,389,482**

**PROCESS FOR FORMING PHOTORESISTS WITH STRONG RESISTANCE TO REACTIVE ION ETCHING AND HIGH SENSITIVITY TO MID- AND DEEP UV-LIGHT**

**Joachim Bargon, Los Gatos; Hiroyuki Hiraoka, Saratoga, and Lawrence W. Welsh, Jr., Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 14, 1981, Ser. No. 330,103**

**Int. Cl.³ G03C *5/24***

**U.S. Cl. 430—325** **5 Claims**

1. In a process for forming a patterned photoresist by pattern-wise exposing a resist material to light and developing with a solvent, the improvement of increasing the resistance of the resist to reactive ion etching by employing as the resist a copolymer of methacrylonitrile and methacrylic acid and by baking the resist in two stages, one before and one after the exposure to light with the first baking being at a temperature and for a time sufficient to increase the photosensitivity of the photoresist, and with the second baking being at a temperature and for a time sufficient to increase the ion etching resistance of the patterned photoresist.

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**4,389,483**

**METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION**

**Hirofumi Hiraga, Yokohama; Minoru Yoshimura, Kawasaki; Shigeho Ikeda, and Hiroe Yoshii, both of Yokohama, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan**

**Filed Dec. 17, 1981, Ser. No. 331,758**

**Claims priority, application Japan, Dec. 29, 1980, 55-185678**

**Int. Cl.³ C12P *13/14, 13/18;* C12R *1/13, 1/15***

**U.S. Cl. 435—110** **3 Claims**

1. A method for producing L-glutamic acid by fermentation, which comprises: culturing aerobically in a culture medium a mutant of the genus of Brevibacterium or Corynebacterium which is resistant to Decoyinine, Psicofuranine, Formycin, Toyocamycin, Cordice, Sangwanycin, or Tubercidin and which is capable of producing L-glutamic acid, and recovering the L-glutamic acid which accumulates in the culture medium.

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**4,389,484**

**METHOD FOR PRODUCING CITRIC ACID**

**Takeshi Tabuchi, and Matazo Abe, both of Tokyo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 783,740, Dec. 13, 1968, abandoned, which is a continuation-in-part of Ser. No. 735,199, Jun. 7, 1968, abandoned. This application Jun. 16, 1978, Ser. No. 916,261**

**Claims priority, application Japan, Jun. 7, 1967, 42-36391; Dec. 13, 1967, 42-79802**

**Int. Cl.³ C12P *7/48;* C12N *1/28;* C12R *1/72, 1/73, 1/74***

**U.S. Cl. 435—144** **29 Claims**

1. A method for producing citric acid which comprises inoculating a citric acid-accumulating and hydrocarbon-assimilating strain of a yeast belonging to the genus Candida in an aqueous culture medium containing at least one normal paraffin containing 9 to 20 carbon atoms in the molecule as the main carbon source; incubating the culture at a pH of from about 4 to about 7.5 until citric acid is substantially accumulated in the culture broth; and separating the so-accumulated citric acid therefrom.

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**4,389,485**

**URICASE PRODUCTION METHOD**

**Roberto Olivieri, Mentana; Eugenio Fascetti; Pierluigi Ciuffolotti, both of Rome, and Ludwig Degen, Rome, all of Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy**

**Filed Aug. 20, 1981, Ser. No. 294,510**

**Claims priority, application Italy, Sep. 19, 1980, 24757 A/80**

**Int. Cl.³ C12N *9/06;* C12Q *1/62;* C12R *1/265***

**U.S. Cl. 435—191** **5 Claims**

1. A process for the production of uricase comprising the step of culturing the microorganism *Micrococcus roseus* NRRL B-12196 under aerobial conditions in the presence of a culturing medium containing a source of assimilable carbon, a nitrogen source, a phosphorus source and mineral salts.

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**4,389,486**

**BIOLOGICALLY PURE CULTURE**

**Toshihito Mori; Takeo Deushi; Akio Iwasaki; Takafumi Kunieda; Toshimi Mizoguchi; Kazuhiro Kamiya; Masahoto Nakayama, all of Higashimurayama; Hisakatsu Ito, Kawagoe, and Takeshi Oda, Kodaira, all of Japan, assignors to Kowa Company, Ltd., Japan**

**Division of Ser. No. 955,412, Oct. 26, 1978, Pat. No. 4,328,307, which is a division of Ser. No. 888,149, Mar. 16, 1978, Pat. No. 4,206,206. This application Oct. 29, 1981, Ser. No. 316,526**

**Claims priority, application Japan, Mar. 24, 1977, 52-31580; Nov. 8, 1977, 52-133051**

**Int. Cl.³ C12N *1/20***

**U.S. Cl. 435—253** **1 Claim**

1. A biologically pure culture of *Saccharopolyspora hirsuta* KC-6606 which has the characteristics identified as FERM P No. 3912 or ATCC 20501 and has the ability to produce an antibiotic KA-6606 by fermentation in nutrient culture medium containing a carbon source, a nitrogen source and minerals.

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**4,389,487**

**PROCESS FOR THE PREPARATION OF A COLLAGEN PRODUCT FOR MEDICAL AND COSMETIC PURPOSES**

**Peter E. Ries, Reinach, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland**

**PCT No. PCT/CH80/00107, § 371 Date Jun. 8, 1981, § 102(e) Date May 29, 1981, PCT Pub. No. WO81/00963, PCT Pub. Date Apr. 16, 1981**

**PCT Filed Sep. 17, 1980, Ser. No. 269,023**

**Claims priority, application Switzerland, Oct. 8, 1979, 9030/79**

**Int. Cl.³ C07G *7/00***

**U.S. Cl. 435—273** **7 Claims**

1. In a process for the preparation of collagen products for medical and cosmetic purposes comprising the steps of finely comminuting collagen-containing animal tissues at temperatures not exceeding 40° C., degreasing the resulting tissue pulp and simultaneously removing therefrom undesireable water-soluble non-collagen type ballast substances by repeatedly treating the said tissue pulp with about a five-fold volume, based on the pulp volume, of a 5 to 15% aqueous sodium chloride solution containing about 0.2 to 1 part by weight of sodium azide as a preserving agent per 1000 parts by weight of the said solution and 0.5 to 2% by weight of a non-ionic fat-dispersing wetting agent, washing the resulting fiber pulp with water or 0.1 to 0.5% aqueous formic, acetic or citric acid, digesting the fiber pulp for 8 to 48 hours at a pH of about 2.5 to 3.5 in a five-fold volume, based on the volume of the pulp, of 0.1 to b 5% aqueous acetic acid containing about 1 part by weight of pepsin per 1000 parts by weight of the tissue used as the starting material in order to remove non-collagen type proteins and telopeptides, precipitating collagen from the resulting collagen suspension by the addition thereto of aqueous sodium chloride in such a quantity that the sodium chloride concentration of the suspension is about 3 to 5%, separating the precipitated collagen and substantially desalting it by ultrafiltration, dialysis or washing with 60 to 75% aqueous ethyl

alcohol so that the collagen concentration in the desalted solution is about 1%, dissolving the desalted collagen in demineralized or distilled water containing up to 3% by weight of a volatile strong organic acid in such a proportion that the concentration of collagen in the resulting solution corresponds to a dry residue of about 0.5 to 2% by weight, freeze-drying the collagen solution, and sterilizing the freeze-dried collagen product, the improvement comprising:

subjecting the collagen product to a heat treatment or a treatment with gaseous hydrogen halide after freeze-drying, before or after sterilization, for a time sufficient to impart increased absorption and wet strength to the collagen product.

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**4,389,488**

## PROCESS FOR THE ENZYMATIC PREPARATION OF L-2-AMINO-4-METHYLPHOSPHINOBUTYRIC ACID

**Susanne Grabley, Kelkheim, and Klaus Sauber, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

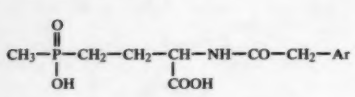
**Filed Dec. 21, 1981, Ser. No. 332,852**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048612**

**Int. Cl.³ C07B** *19/02;* **C12P** *13/04;* **C12R** *1/19*

**U.S. Cl. 435—280** **5 Claims**

1. A process for the enzymatic separation of D,L-2-amino-4-methylphosphinobutyric acid, which comprises treating its N-aracetyl derivatives of the formula



I

(in which Ar represents a phenyl radical which is optionally substituted by halogen or hydroxyl) in an aqueous or aqueous-organic medium with a penicillin-G-acylase.

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**4,389,489**

## OPTICALLY PURE HETEROCYCLIC AMINOACID COMPOUNDS, A PROCESS FOR THEIR USE FOR THE SYNTHESIS OF MEDICAMENTS

**Michael Preiss, and Hermann Schutt, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

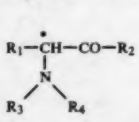
**Division of Ser. No. 163,359, Jun. 26, 1980, abandoned. This application Jun. 15, 1981, Ser. No. 274,083**

**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927534**

**Int. Cl.³ C07B** *19/02;* **C12P** *13/04;* **549** *493*

**U.S. Cl. 435—280** **4 Claims**

1. A process for the production of a compound which is an optically pure heterocyclic aminoacid of the general formula



(I)

or a salt, preferably a pharmaceutically acceptable salt, thereof, in which

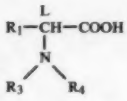
$R_1$ denotes a saturated or unsaturated, optionally substituted heterocyclic radical which contains 1 to 4 identical or different heteroatoms selected from oxygen, sulphur and nitrogen and is optionally benzo-fused,

$R_2$ denotes a hydroxyl group, a $C_1$ to $C_4$ alkoxy group or a $N(R_5)_2$ radical,

$R_3$ and $R_4$ independently denote a hydrogen atom, an acyl radical or a $C_2$ to $C_4$ alkenyl radical which is substituted by $C_1$ to $C_4$ alkoxy carbonyl and

$R_5$ denotes a hydrogen atom or a $C_1$ to $C_4$ alkyl group,

and in which the carbon atom marked with • is in either the D-form or the L-form which comprises subjecting a racemic compound of the formula (I) in which $R_1$, $R_3$ and $R_5$ are defined as above, $R_2$ denotes a $C_1$ to $C_4$ alkoxy group or a $N(R_5)_2$ radical and $R_4$ denotes an acyl radical, or a $C_2$ to $C_4$ alkenyl radical which is substituted by $C_1$ to $C_4$ alkoxycarbonyl, to a proteolytic enzyme bonded to a carrier in a two-phase medium consisting of water and and water-immiscible solvent, separating off the unchanged D-compound from the L-compound of the formula



in which $R_1$, $R_3$ and $R_4$ have the above-mentioned meaning, and, if desired, converting the D- and L-compounds which have been separated from each other into compounds of the formula (I) in which $R_2$ denotes a hydroxyl group and $R_3$ and $R_4$ denote hydrogen atoms, and in the case of the L-compound converting, if desired, the carboxyl group into a $—COR_2$ group in which $R_2$ denotes $C_1$ to $C_4$ alkoxy group or a $N(R_5)_2$ radical in which $R_5$ has the above-mentioned meaning.

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**4,389,490**

## METHOD OF STABILIZING PLATELETS FOR DETERMINING MULTIPLE PLATELET PARAMETERS IN REFERENCE CONTROL AND CALIBRATOR COMPOSITIONS; AND DILUENTS THEREOF

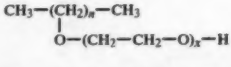
**Harold R. Crews, Miami; James H. Carter, II, Ft. Lauderdale, and Ted Sena, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.**

**Filed May 29, 1981, Ser. No. 268,049**

**Int. Cl.³ G01N** *33/48;* **C09K** *3/00*

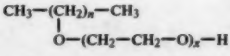
**U.S. Cl. 436—17** **14 Claims**

1. A method of stabilizing platelets for determining multiple platelet parameters in reference controls and calibrators for electronic particle counting instruments which comprises adding to a platelet rich plasma a composition containing glutaraldehyde in a concentration of 0.1% to 5% w/v, and a non-ionic surfactant which is a mixture of ethoxylates of isomeric linear alcohols having the formula:



in which the polyoxyethylene chain is randomly attached to the linear aliphatic chain, n=9 to 13, and x=9 to 13, said nonionic surfactant being present in a concentration of 0.01 to 1% w/v, and the mixture being adjusted to a preselected range of pH and osmolality.

2. A method of stabilizing platelets for determining multiple platelet parameters in reference controls and calibrators for electronic particle counting instruments which comprises adding to a platelet rich plasma a composition containing glutaraldehyde in a concentration of 0.1% to 5% w/v, and a non-ionic surfactant which is a mixture of ethoxylates of isomeric linear alcohols having the formula:



in which the polyoxyethylene chain is randomly attached to the linear aliphatic chain, n=9 to 13, and x=9 to 13, said

nonionic surfactant being present in a concentration of 0.01% to 1% w/v and the mixture being adjusted to a pH of 7.3 to 7.4 and an osmolality of 290 mOs/kg.

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4,389,491

## METHOD AND KIT FOR CHROMATOGRAPHIC SEPARATION OF HEMOGLOBIN $A_{1c}$

Mark S. Hanamoto, Mill Valley, and Steve K. Tanaka, Vallejo, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Apr. 26, 1982, Ser. No. 371,844
Int. Cl.³ G01N *33/72, 33/66*
U.S. Cl. 436—67 33 Claims

1. A method for the separation of hemoglobin $A_{1c}$ from other glycosylated and nonglycosylated hemoglobins and the Schiff base precursor to hemoglobin $A_{1c}$ in a sample of human blood which comprises:

(a) lysing the red blood cells contained in said sample to form a hemolysate containing said hemoglobin $A_{1c}$, said glycosylated and nonglycosylated hemoglobins, and said Schiff base precursor,

(b) impregnating a weak cation exchanger with said hemolysate,

(c) passing through said exchanger a first buffer solution with ions of an alkali metal dissolved therein at a concentration of from about 0.02 M to about 0.05 M to dissociate said Schiff base precursor into glucose and hemoglobin A and to preferentially elute said glucose and said other glycosylated hemoglobins over said hemoglobin A, said hemoglobin $A_{1c}$ and said other nonglycosylated hemoglobins,

(d) passing through said exchanger a second buffer solution containing ions of an alkali metal dissolved therein at a concentration of from about 0.06 M to about 0.11 M to preferentially elute said hemoglobin $A_{1c}$ over said hemoglobin A and said other nonglycosylated hemoglobins, and

(e) recovering the eluate from step (d).

31. A kit for use in an assay for determining the hemoglobin $A_{1c}$ content in a sample of human blood without interference from other glycosylated or nonglycosylated hemoglobins or the Schiff base precursor to hemoglobin $A_{1c}$, said kit comprising:

(a) a weak cation exchanger,

(b) a first buffer solution with ions of an alkali metal dissolved therein at a concentration of from about 0.02 M to about 0.05 M, and

(c) a second buffer solution with ions of an alkali metal dissolved therein at a concentration of from about 0.06 M to about 0.11 M.

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4,389,492

## SPINEL-MAGNESIA BASIC BRICK

Fumikazu Tanemura, Aichi, Japan, assignor to Mino Yogyo Co., Ltd., Gifu, Japan

Filed Oct. 5, 1981, Ser. No. 308,672
Claims priority, application Japan, Oct. 7, 1980, 55/140290
Int. Cl.³ C04B *35/04*
U.S. Cl. 501—112 3 Claims

1. A spinel-magnesia basic brick composition consisting essentially of 10–50% spinel ($MgO.Al_2O_3$) clinker, 50–90% magnesia clinker, and 0.5–4.5% diiron trioxide, ($Fe_2O_3$), said diiron trioxide being present on the basis of the amounts of said spinel and magnesia clinkers totalling 100% by weight.

4,389,493

## PROCESS FOR THE PRODUCTION OF SILICON-CONTAINING AND CARBON-CONTAINING RAW MATERIAL MOLDINGS, AND THE USE OF SUCH MOLDINGS

Gert-Wilhelm Lask, Uberhena, Fed. Rep. of Germany, assignor to International Minerals & Chemical Luxembourg Societe Anonyme, Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 242,991, Mar. 12, 1981, abandoned. This application Apr. 8, 1981, Ser. No. 252,063
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009808
Int. Cl.³ C04B *35/52*
U.S. Cl. 501—154 5 Claims

1. A method of making silicon-and-carbon-containing bodies capable of being treated in an electric furnace to produce silicon or a silicon alloy, comprising the steps of mixing a fine-grain silicon carrier in the form of $SiO_2$ with fine-grain caking coal to form a substantially binder-free mixture, and hot briquetting the substantially binder-free mixture at a temperature of 350° to 550° C. to coherent briquettes constituting said bodies, the carbon content being about 40% by weight of the silicon carrier.

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4,389,494

## PROCESS FOR PRODUCING A MEMBRANE FOR ELECTROLYSIS BY FORMING REMOVABLE THIN LAYER UPON ELECTRODE

Manabu Suhara; Tomoki Gunjima, and Haruhisa Miyake, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,546
Claims priority, application Japan, Jul. 29, 1980, 55-103096
Int. Cl.³ B01J *47/12;* C25C *7/02*
U.S. Cl. 521—27 5 Claims

1. A process for producing an ion exchange membrane for electrolysis which comprises forming a removable thin layer of polyacrylate, polyvinylalcohol optionally mixed with inorganic fiber on a surface of a perforated electrode; forming a layer of a thermoplastic fluorinated polymer having ion exchange groups or functional groups convertible to ion exchange groups on said removable thin layer; converting said layer of a thermoplastic fluorinated polymer into a liquid impermeable membrane; and removing said removable thin layer by treating with an aqueous solution of an alkali metal hydroxide, and if necessary, converting said functional groups into ion exchange groups.

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4,389,495

## FOAMABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Sep. 24, 1982, Ser. No. 422,629
Int. Cl.³ C08J *9/20*
U.S. Cl. 521—56 6 Claims

1. An expandable polymeric styrene particle having incorporated therein a blowing agent, from about 0.1% to about 0.5% by weight of bis(allyl ether) of tetrabromobisphenol A and from about 0.6% to about 1.5% by weight of pentabromomonochlorocyclohexane all percentages being based upon the weight of the polymeric styrene.

**4,389,496**

## THIXOTROPIC FORMULATIONS OF SILICONE PASTES FOR IMPRESSIONS OF TEETH AND MUCOUS MEMBRANE

**Bernhard Leüsner, Leverkusen; Hans-Hermann Schulz, Leichlingen; Reiner Voigt, and Michael Walkowiak, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 128,340, Mar. 7, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,623**

**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910560**

**Int. Cl.³ C09K** *3/00*

**U.S. Cl. 523—109** **12 Claims**

1. A thixotropic silicone paste for the production of impressions, said paste consisting essentially of

(a) 50–90%, based on the weight of the paste, of a silicone oil with terminal hydroxyl groups;

(b) 1–15%, based on the weight of the paste, of an organic thixotropic agent; and

(c) 5–50% of calcium silicate,

wherein

(i) said calcium silicate has a specific surface area of 20 to 100 $m^2/g$ (measured by the BET method) and

(ii) said thixotropic agent is selected from the group consisting of hydrogenated castor oil and polyglycol ethers of glycerides.

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**4,389,497**

## USE OF AGGLOMERATES OF SILICIC ACID AS FILLERS IN DENTAL MATERIALS

**Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, Hechendorf, and Heinz-Joachim Hübner, Seefeld, all of Fed. Rep. of Germany, assignors to Espe Fabrik parmazeutischer Präparate GmbH, Fed. Rep. of Germany**

**PCT No. PCT/EP80/00135, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01366, PCT Pub. Date May 28, 1981**

**PCT Filed Nov. 21, 1980, Ser. No. 285,115**

**Claims priority, application Fed. Rep. of Germany, Nov. 22, 1979, 2947129**

**Int. Cl.³ A61K** *5/06;* **C08K** *3/36*

**U.S. Cl. 523—116** **16 Claims**

1. A dental material comprising a polymerizable monomer and an inorganic filler, said filler comprising agglomerates of silicic acid having an average agglomerate size of 0.5 to 50 μm, said agglomerates comprising primary particles of silicic acid having an average particle size of 1 to 100 nm.

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**4,389,498**

## OXIDATIVELY COUPLED COLD-SET BINDERS

**Charles E. Seeney, Brazil; John F. Kraemer, Terre Haute, both of Ind., and Nancy C. Varnum, Kingsville, Mo., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.**

**Division of Ser. No. 283,718, Jul. 16, 1981. This application Aug. 25, 1982, Ser. No. 411,201**

**Int. Cl.³ C08L** *49/00*

**U.S. Cl. 523—139** **17 Claims**

1. A foundry composition adaptable to forming cores and molds comprising a foundry aggregate, a polymerizable binder therefor, an amine and a metal salt catalyst, the binder being a diacetylene compound resin.

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**4,389,499**

## ERASABLE INKS CONTAINING THERMOPLASTIC BLOCK COPOLYMERS

**Diane A. Riesgraf, Rockville, Md., assignor to The Gillette Company, Boston, Mass.**

**Filed Nov. 5, 1981, Ser. No. 318,306**

**Int. Cl.³ C08K** *5/01;* **C09D** *11/18;* **C08L** *53/00*

**U.S. Cl. 523—161** **7 Claims**

1. An erasable ink for use in a ball-point writing instrument comprising a pigmented organic solvent solution containing a mixture of thermoplastic block copolymers at least one of which has an arrangement of A (thermoplastic) and B (rubbery) blocks selected from the class consisting of ABA and $(-AB-)_n$; at least one other of which has an arrangement of A (thermoplastic) and B (rubbery) blocks consisting of $(AB)_nX$; in which said thermoplastic blocks are selected from the class consisting of styrene, ester and urethane blocks; in which said rubbery blocks are selected from the class consisting of butadiene, isoprene and ethylene-butylene blocks; in which the ratio of said rubbery blocks to said thermoplastic blocks is from 60:40 to 90:10; and in which the solubility parameter of said organic solvent is from about 7 to about 10.5.

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**4,389,500**

**Patent Not Issued For This Number**

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**4,389,501**

## SULFUR MODIFIED EPOXY RESIN SEALING COMPOSITION

**Michael V. Burris, 1750 Industrial Rd., Las Vegas, Nev. 89102**

**Filed Nov. 9, 1981, Ser. No. 319,633**

**Int. Cl.³ C08L** *63/00*

**U.S. Cl. 523—400** **4 Claims**

1. An epoxy resin composition consisting essentially of an epoxy resin, a polyamide curing agent, and between about 0.1 and about 10% by weight of elemental sulfur.

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**4,389,502**

## CLEAR AIR-DRY ACRYLIC LACQUER COATING COMPOSITION

**Grant C. Fry, and Walter C. Meyer, both of Lake Orion, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 24, 1981, Ser. No. 334,161**

**Int. Cl.³ C08L** *1/14*

**U.S. Cl. 524—37** **13 Claims**

1. A clear coating composition consisting essentially of 5–40% by weight of a film-forming binder and 60–95% by weight of volatile organic solvents; wherein the binder consists essentially of:

(a) about 0–65% by weight, based on the weight of the binder, of one or more polymers selected from the group consisting of poly(methyl methacrylate) and other copolymers of methyl methacrylate having a relative viscosity of about 1.17 to 1.20 measured at 25° C. on a 0.5% polymer solids solution using dichloroethylene solvent;

(b) about 0–25% by weight, based on the weight of the binder, of cellulose acetate butyrate having a viscosity of about 1–20 seconds and a butyryl content of 30–55% by weight;

(c) about 10–40% by weight, based on the weight of the binder, of a polyester plasticizer comprising the reaction product of a polyol and an organic dicarboxylic acid or an anhydride of an organic dicarboxylic acid having an acid number of 0.1–10;

(d) about 0–10% by weight, based on the weight of the binder, of a phthalate plasticizer; and

(e) about 15–80% by weight, based on the weight of the

binder, of a terpolymer of about 20–90% by weight of units of methyl methacrylate, 2–40% by weight of units of ethyl acrylate, and 2–60% by weight of units of t-butylaminoethyl methacrylate;

wherein (a), (b), (c), (d), and (e) total 100%.

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4,389,503

## OPAQUE JET INK COMPOSITIONS

**Dorothy Maxwell, and David A. Fell, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.**

**Division of Ser. No. 177,944, Aug. 14, 1980, Pat. No. 4,352,901. This application Apr. 28, 1982, Ser. No. 372,820**

**Int. Cl.³ C08L** *1/14;* **C08K** *5/06;* **C08L** *93/00;* **C08K** *5/07*

**U.S. Cl. 524—38** **11 Claims**

1. A method of producing opaque indicia with jet printing apparatus consisting essentially of the steps of

(1) providing a jet ink composition consisting essentially of (A) 2 to 15% by weight of a gellable cellulose ester film former having a hydroxyl content of between 2 to 8% by weight, (B) between 1.5 and 15% of a binding agent selected from the group consisting of rosin based ester resins and maleic type resins soluble in dilute alkali solutions, polyvinyl acetate resins, acrylic resins, polyvinyl acetate and acrylic copolymer resins, and combinations of the same, and (C) a solvent blend, the solvent blend being a mixture of (1) a solvent selected from the group consisting of aliphatic alcohols of one to three carbons, ethers of four to ten carbons, acetone, other aliphatic ketones of four to seven carbons, acetates of three to seven carbons, and compatible combinations of the same, said acetates and other ketones being less than 50% of the solvent present in the composition, and (2) a non-solvent of low volatility within which the film former is essentially insoluble, the non-solvent being between 2 and 10% by weight of the jet ink composition, said solvent blend not containing an azeotrope that solubilizes the film former, and the binding agent being soluble in the solvent blend;

(2) dispensing said ink composition in a continuous stream of electrically deflectable droplets onto a non-porous substrate at essentially ambient conditions to form indicia, whereby rapid auto-evaporation of the solvent blend forms a gelled film comprising residual solvent blend, cellulose ester and binding agent; said gelled film containing a multiplicity of microdroplets of solvent blend comprising substantially the non-solvent component of the ink composition, further auto-evaporation of the remaining solvent blend forming a reticulated ester-resin film having a multiplicity of microvoids, said microvoids scattering light incident thereto rendering said dry film opaque.

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4,389,504

## ELASTOMER TOUGHENED POLYIMIDE ADHESIVES

**Anne K. St. Clair, and Terry L. St. Clair, both of Poquoson, Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.**

**Filed Oct. 2, 1981, Ser. No. 308,201**

**Int. Cl.³ C08K** *5/20*

**U.S. Cl. 524—233** **6 Claims**

1. A method for preparing a high temperature elastomer-containing addition polyamic acid adhesive in a solvent solution which comprises:

chemically reacting an aromatic diamine and an aromatic amine-terminated butadiene/acrylonitrile (AATBN) or an aromatic amine-terminated silicone (AATS) with an aromatic dianhydide selected from the group consisting of:

3,3',4,4'-benzophenone tetracarboxylic acid dianhydride,

4,4'-oxydiphthalic anhydride,

2,2-bis(3-4-dicarboxyphenyl) hexafluoropropane dianhydride,

bis(3,4-dicarboxyphenyl) sulfone dianhydride, and

bis-(4-(3',4'-dicarboxyphenoxy) diphenyl sulfone dianhydride,

each member of said group of dianhydrides being mixed with a reactive endcapping agent;

all ingredients being dissolved and reacted in a solvent or mixture of solvents, at least one of which is selected from the group consisting of:

N,N'-dimethylformamide,

N,N'-dimethylacetamide,

N-methyl-2-pyrrolidone, and

dimethylsulfoxide,

to yield an addition polyamic acid adhesive solution having the inherent physical property characteristic of being converted to a fully crosslinked polyimide matrix with rubbery inclusions when applied to substrate surfaces and heated in the range of 250°–300° C. under pressure.

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4,389,505

## PLASTICIZED POLYACRYLONITRILE, A FILM THEREOF AND A PROCESS FOR FILM PREPARATION AND PLASTICIZATION

**Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 16, 1981, Ser. No. 331,427**

**Int. Cl.³ C08K** *5/06*

**U.S. Cl. 524—376** **21 Claims**

1. A plasticized polyacrylonitrile composition comprising:

(a) a high nitrile addition polymer having at least 80% acrylonitrile repeating units; and containing

(b) a plasticizing proportion of a liquid polyether prepared by reacting ethylene oxide and propylene oxide with at least one monohydric alcohol active hydrogen compound initiator having about 1 to about 10 aliphatic carbon atoms to yield a heterized copolymer, wherein said polyether is water soluble or water miscible and has an average molecular weight of from about 500 to about 5,000 and a Saybolt viscosity at 100° F. of from about 85 to about 5200 seconds.

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4,389,506

## POLYVINYL ALCOHOL DUST SUPPRESSION BY ADMIXING POLYGLYCOL

**Thomas Hassall, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jun. 29, 1981, Ser. No. 276,668**

**Int. Cl.³ C08F** *6/00;* **C08K** *5/06*

**U.S. Cl. 524—377** **5 Claims**

1. A process for the preparation of a substantially dustless polyvinyl alcohol powder with a viscosity of 2 to 125 mPa.s and a degree of hydrolysis of at least 80 mole percent comprising contacting the polyvinyl alcohol with about 0.5 to 4.0 weight percent of a dedusting additive selected from the group consisting of polyethylene glycol with a molecular weight (number average) of about 200 to 14,000 and an oxyethylene content of 3 to 400 moles, and methoxypolyethylene glycol with an oxyethylene content of 3 to 400 moles and a molecular weight (number average) of 200 to 14,000, said contacting taking place at a temperature at which the polyglycol is a liquid and at which the PVA is not subject to degradation.

4. The product of the process of claim 1 or claim 2.

4,389,507

## FILLER-CONTAINING BEAD POLYMERS

Wolfgang Podszun, Cologne; Carlhans Süling, Odenthal; Michael Walkowiak, Leverkusen, and Hans-Hermann Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 93,293, Nov. 13, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,784

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849279; Nov. 17, 1978, 2849936

Int. Cl.³ C08L 31/00

U.S. Cl. 524—460 8 Claims

1. A process for the production of cross-linked bead polymers of (meth)acrylic acid esters and up to 20% by weight of other monomers, filled with a uniformly distributed inorganic filler and having an average diameter of from 5 to 500μ comprising

(i) working inorganic filler into a monomer liquid or a mixture, of monomer liquid and polymer, said monomer or said mixture, respectively, having a viscosity of from 0.1 to 10 Pa.s at the dispersion temperature,

(ii) adding a polymerization ititiator to the mixture of filler, monomer liquid and, optionally, polymer and suspending the mixture in an aqueous medium in the presence of a dispersant and

(iii) polymerizing the suspension by heating it to the decomposition temperature of said initiator, said monomer liquid containing a cross-linking agent.

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4,389,508

## COMPOSITION FOR AN INTERLAYER OF LAMINATED SAFETY GLASS

Takeshi Mori, Kusatsu; Toshiyuki Takashima; Kenichi Asahina, both of Shiga; Toshiharu Matsumiya, Shinnanyo, and Ariyasu Sugita, Yamaguchi, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha and Tokuyama Sekisui Kogyo Kabushiki Kaisha, both of Osaka, Japan

Continuation of Ser. No. 155,082, Jun. 2, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,337

Claims priority, application Japan, May 31, 1979, 54-68502

Int. Cl.³ C08K 5/57, 5/10

U.S. Cl. 524—548 4 Claims

1. A composition for an interlayer film of a laminated safety glass, said composition comprising (A) a thermoplastic resin resulting from copolymerization of (1) vinyl chloride, (2) glycidyl methacrylate and (3) ethylene, said thermoplastic resin comprising 80 to 98.5% by weight of vinyl chloride, 1 to 10% by weight of glycidyl methacrylate and 0.5 to 10% by weight of ethylene, (B) 10 to 40% by weight of a plasticizer, and (C) 1 to 10 parts by weight of an organotin stabilizer per 100 parts by weight of said thermoplastic resin.

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4,389,509

## CATHODICALLY DEPOSITABLE COATING COMPOSITIONS

Georgios Pampouchidis; Wolfgang Daimer, and Heiner Verdino, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Dec. 19, 1977, Ser. No. 860,145

Claims priority, application Austria, Dec. 13, 1976, 9210/76

Int. Cl.³ C08L 75/04

U.S. Cl. 524—591 11 Claims

1. Thermosetting aqueous binders for cathodically depositable coatings comprising the reaction product of (A) a hydroxyl group containing diene polymer having a hydroxyl number of at least about 40 mg KOH/g, and an average maximum molecular weight of about 4000; and (B) compounds carrying per molecule an average of from about 0.8 to 1.5 free isocyanate groups and at least one basic aliphatically bound nitrogen atom, neutralized with inorganic or organic acids.

4,389,510

## WATER SOLUBLE POLYIMIDE PREPARED FROM 1,2,3,4 BUTANE TETRACARBOXYLIC ACID AND METHOD OF PREPARATION

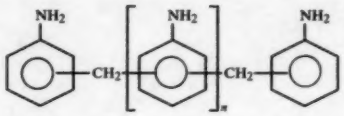
Charles W. McGregor, and Lionel J. Payette, both of Fort Wayne, Ind., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 17, 1981, Ser. No. 255,206

Int. Cl.³ C08G 73/10

U.S. Cl. 524—600 7 Claims

1. A water soluble polyimide comprising the reaction product of 1, 2, 3, 4 butane tetracarboxylic acid, a multifunctional amine of the formula:



and at least one diamine; where n=0.3, the multifunctional amine constitutes at least 5% of the total amine equivalents of the reactants and the butane tetracarboxylic acid to amine molar ratio is 100:94.8 to 100:98.

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4,389,511

## BLENDS OF POLYPHENYLENE ETHER RESINS AND STYRENE-TERT-BUTYLSTYRENE COPOLYMERS

Glenn D. Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 4, 1981, Ser. No. 327,440

Int. Cl.³ C08L 61/04

U.S. Cl. 525—68 5 Claims

1. A thermoplastic composition, which comprises a homogeneous, single phase admixture of:

(a) a polyphenylene ether resin; and

(b) a copolymer of styrene and 4-tert-butylstyrene modified with rubber in which the copolymer comprises from 5% to 65% by weight of the 4-tert-butylstyrene based on the total copolymer weight.

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4,389,512

## CYCLOALIPHATIC ACRYLATE COMPOSITIONS

Hans R. Friedli; Donald L. Nelson, and John L. Massingill, Jr., all of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 951,416, Oct. 13, 1978, Pat. No. 4,319,009. This application May 29, 1981, Ser. No. 268,218

Int. Cl.³ C08L 67/00, 63/00; C08G 63/76; C08F 232/00

U.S. Cl. 525—112 4 Claims

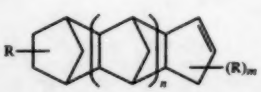
1. A thermosetting resin composition which comprises

(1) vinyl ester resin having terminal unsaturation, and

(2) an unsaturated monomer mixture of a vinyl aromatic monomer and a cycloaliphatic acrylate composition comprising

(A) about 60 to 95 percent by weight of dicyclopentadiene acrylate, methacrylate, or mixtures thereof

(B) about 2 to 15 percent by weight of a mixture of polycyclopentadienyl acrylates of the formula



where

R is $CH_2$=CZ—C(O)—O—

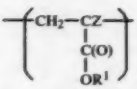
Z is H, or methyl

n is 1, or 2

m is 0 or 1 and when m is 0 there is a double bond present

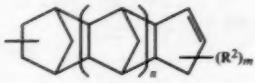
(C) about 1 to about 21 percent by weight of a mixture of the copolymers of methacrylic acid or acrylic acid with adducts of cyclopentadiene with isoprene, piperylene, or mixtures thereof,

(D) about 0.05 to about 10 percent by weight of a mixture of poly acrylates having the repeating unit



where

$R^1$ is hydrogen or



$R^2$ is $CH_2$=CZ—C(O)—O—

Z is H or methyl

n is 0, 1 or 2, and

m is 0 or 1 and when m is 0 there is a double bond present.

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**4,389,513**

## HIGHLY ABSORBENT RESIN

**Hirotoshi Miyazaki, Ibaraki, Japan, assignor to Kuraray Company, Limited, Kurashiki, Japan**

**Filed Oct. 8, 1981, Ser. No. 309,773**

**Claims priority, application Japan, Oct. 22, 1980, 55/148639**

**Int. Cl.³ C08F *8/32***

**U.S. Cl. 525—186** **15 Claims**

1. A highly absorbent resin which is essentially a polyamine-crosslinked, partial neutralization product obtained by reaction of an alkali metal hydroxide with a carboxyl-containing polymer selected from the group consisting of alpha-olefin-maleic anhydride copolymers, vinyl compound-maleic anhydride copolymers, polyacrylic acid, polymethacrylic acid, and mixtures thereof, the degree of neutralization of said neutralization product being within the range of 0.4 to 0.8 equivalent of total carboxyl groups of the said carboxyl-containing polymer, the amount of polyamine having a general formula shown by H—NH—$CH_2CH_2$—n $NH_2$, wherein n is an integer of 1 to 110, as a crosslinking agent, being not more than 2 parts by weight per 100 parts by weight of the neutralization product on the uncrosslinked basis, said resin being capable of absorbing at least 20 times its own weight of distilled water.

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**4,389,514**

## ACCELERATED POLYMERIZATION OF ACRYLIC MONOMERS INITIATED BY DIALKYL AND DIARALKYL PEROXIDE FREE RADICAL GENERATORS IN THE PRESENCE OF TIN ACCELERATORS

**Claude J. Schmidle, Trenton, N.J., and Seevaram N. Varadhachary, Newtown, Pa., assignors to Congoleum Corporation, Kearny, N.J.**

**Continuation of Ser. No. 191,201, Sep. 26, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 327,864**

**Int. Cl.³ C08F *8/42, 4/76***

**U.S. Cl. 525—364** **14 Claims**

1. In a method for increasing the reaction rate of the polymerization and/or cross-linking of reactive polymerizable and/or cross linkable acrylic monomeric materials initiated by dialkyl or diaralkyl peroxides as the free radical generator, the improvement which comprises carrying out such polymerization and/or cross-linking reaction in the presence of from at least 0.1 to about 9% by weight, of a stannous accelerator from the group consisting of stannous alkanoates, alkenoates, aralkanoates and aralkenoates, dialkyl stannous dialknoates, dialkenoates, diaralkanoates and diaralkenoates, and mixtures thereof.

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**4,389,515**

## CURABLE POLYEPOXIDE-UNSATURATED MONOMER COMPOSITIONS SUITABLE FOR USE IN RIM PROCESSES

**Harold E. De La Mare, and Thomas F. Brownscombe, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Dec. 14, 1981, Ser. No. 330,414**

**Int. Cl.³ C08L *63/10***

**U.S. Cl. 525—420.5** **17 Claims**

1. A rapid curing, storage stable, thermosetting composition, especially suitable for use in reaction injection molding processes comprising

(1) an epoxy compound containing more than one vicinal epoxy group,

(2) a miscible amount of at least one ethylenically unsaturated aromatic monomer,

(3) a curing amount of at least one amino compound containing at least three amino hydrogens,

(4) a catalytic amount of lithium or calcium nitrate, and

(5) From about 0.1 to about 3 parts by weight of a polyalkylene ether glycol per 100 parts by weight of epoxy compound.

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**4,389,516**

## CURABLE POLYPHENYLENE ETHER RESIN COMPOSITION

**Akitoshi Sugio, Ohmiya; Masanobu Masu, Tokyo, and Masatugu Matunaga, Ibaraki, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan**

**Filed Mar. 23, 1981, Ser. No. 246,314**

**Claims priority, application Japan, Mar. 24, 1980, 55-37130; Apr. 3, 1980, 55-44428; Apr. 15, 1980, 55-49391**

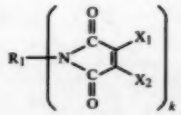
**Int. Cl.³ C08L *71/04***

**U.S. Cl. 525—534** **21 Claims**

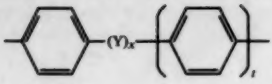
1. A curable polyphenylene ether resin composition comprising:

(a) a polyphenylene ether resin, and

(b) at least one polyfunctional compound selected from the group consisting of polyfunctional maleimides of the general formula:



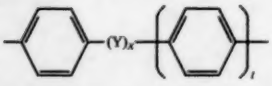
wherein k is an integer of at least 2; $X_1$ and $X_2$ are identical or different and each represents a hydrogen atom, a halogen atom or a lower alkyl group; and $R_1$ represents an aromatic or aliphatic organic group having a valence of k, which is selected from the group consisting of a linear or cyclic aliphatic hydrocarbon group having 4 to 16 carbon atoms, a monocyclic or fused ring aromatic hydrocarbon group, a triazine ring, a moiety resulting from the removal of the amino group from a condensation product of aniline and formaldehyde and a polybenzene group represented by the following formula:



wherein x represents 0 or 1 and when x represents 1, Y represents a linear, branched or cyclic aliphatic hydrocarbon group having 1 to 14 carbon atoms, a phenylene group, a xylylene group, an oxygen atom, a sulfur atom, a carbonyl group, a sulfonyl group, a sulfinyl group, an alkyleneoxyalkylene group, a phosphonyl group, a phosphinyl group, or an imino group; and t is an integer of 1 or 2, or the homoprepolymer thereof obtained by reacting at least one of said polyfunctional maleimides under heat and stopping the reaction before the reaction mixture is gelled, polyfunctional cyanate esters of the general formula:

$$R_2\text{-}(\text{O—C}\equiv\text{N})_l$$

wherein l is an integer of at least 2; and $R_2$ represents an aromatic organic group having a valence of l, which is selected from the group consisting of a monocyclic or fused ring aromatic hydrocarbon roup, a triazine ring, a residue resulting from the removal of the amino group from a condensation product of aniline and formaldehyde and a polybenzene group represented by the following formula:



wherein x represents 0 or 1 and when x represents 1, Y represents a linear, branched or cyclic aliphatic hydrocarbon group having 1 to 14 carbon atoms, a phenylene group, a xylylene group, an oxygen atom, a sulfur atom, a carbonyl group, a sulfonyl group, a sulfinyl group, an alkyleneoxyalkylene group, a phosphonyl group, a phosphinyl group, or an imino group; and t is an integer of 1 or 2, wherein the groups $-(\text{O—C}\equiv\text{N})_l$ are directly bonded to the aromatic ring of the organic group, or the homoprepolymers thereof obtained by polymerizing at least one of said polyfunctional cyanate esters and containing in the molecule a sym-triazine ring formed by the trimerization of the cyano groups, and precopolymers thereof obtained by reacting said polyfunctional maleimide with said polyfunctional cyanate ester under heat and stopping the reaction before the reaction mixture is gelled.

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**4,389,517**

## HYDROGENATION OF PHENYLACETYLENE PRIOR TO STYRENE POLYMERIZATION

**Duane B. Priddy, and James M. Roe, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 2, 1982, Ser. No. 364,958**
**Int. Cl.³ C08F *4/48, 112/08***
**U.S. Cl. 526—64** **4 Claims**

1. A process for the preparation of styrene polymers from a petroleum byproduct stream by providing a byproduct stream from the cracking of petroleum products, the stream containing primarily compounds containing 8 carbons and of an aromatic nature, the stream comprising 30 to 60 parts by weight styrene, 40 to 70 parts by weight of mixed isomers of xylene and 0.5 to 2 parts by weight of phenylacetylene, hydrogenating at least a major portion of the phenylacetylene in the stream to styrene, passing the hydrogenated stream to a continuously stirred tank reactor and initiating polymerization of the styrene in the stream with an organolithium initiator whereby at least 99 percent of the styrene initially present in the stream is converted to polymer, discharging the stream from the reactor and recovering styrene polymer therefrom.

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**4,389,518**

## PROCESS FOR PRODUCING POLYETHYLENE

**Masato Harada, Kisarazushi; Atsushi Suzuki, Ichiharashi; Sadahiko Yamada, Ichiharashi, and Jun Masuda, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan**

**Filed Aug. 25, 1981, Ser. No. 296,148**
**Claims priority, application Japan, Aug. 29, 1980, 55-119387**
**Int. Cl.³ C08F *4/02, 10/02***
**U.S. Cl. 526—97** **2 Claims**

1. A process for producing polyethylene by ethylene polymerization in the presence of a catalyst obtained by combining a solid product (II), obtained by the following steps (a) and (b), with an organoaluminum compound:

(a) obtaining a solid product (I) by reacting

(i) a trivalent metal halide selected from the group consisting of anhydrous aluminum chloride and anhydrous ferric chloride, with

(ii) a divalent metal hydroxide, oxide, carbonate or a composite compound containing a divalent metal hydroxide, oxide or carbonate or a hydrate of a divalent metal compound,

the ratio by weight of said (i) to said (ii) being in the range of 1 to 20; and

(b) reacting in the presence of a polysiloxane, said solid product (I) with at least two kinds of transition metal compounds consisting of

(1) at least one halogen-containing transition metal compound selected from the group (A) consisting of the halides, oxyhalides, alkoxyhalides and acetoxyhalides of titanium or vanadium, and

(2) at least one halogen-free transition metal compound selected from the group (B) consisting of tetraalkyl orthotitanates, vanadyl trialcoholoates and polytitanic acid esters expressed by the general formula

$$RO\text{-}\left[\text{Ti}(OR)_2\text{—O}\right]_m\text{R}$$

wherein m is an integer of 2 or more and the Rs are the same or different kinds of alkyl groups, aryl groups or aralkyl groups.

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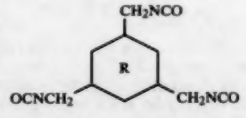
**4,389,519**

## COMPOSITION FOR POLYURETHANE ADHESIVES

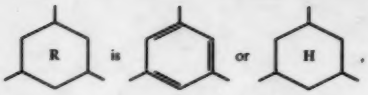
**Kyuya Yamazaki, Ibaraki; Sachio Igarashi, Suita, and Koichi Shibata, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Nov. 16, 1981, Ser. No. 321,926**
**Claims priority, application Japan, Nov. 28, 1980, 55-168374**
**Int. Cl.³ C08G *18/75, 18/79***
**U.S. Cl. 528—73** **8 Claims**

1. A composition for polyurethane adhesives which comprises (1) a triisocyanate of the formula:




wherein




a modified product of said triisocyanate selected from the group consisting of a dimer of said triisocyanate, a trimer of said triisocyanate and a carbodiimide of said triisocyanate or an adduct of said triisocyanate having terminal isocyanate groups in a reaction product of said triisocyanate with an active hydrogen compound, and

(2) an active hydrogen compound; wherein the proportions of (1) and (2) are such that the NCO/OH equivalent ratio is 0.4 to 20.

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**4,389,520**

## ADVANCEMENT CATALYSTS FOR EPOXY RESINS

**John A. Gannon, Danbury, Conn., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Apr. 5, 1982, Ser. No. 365,729**

**Int. Cl.³ C08G *59/62, 59/68***

**U.S. Cl. 528—89** **8 Claims**

1. A precatalyzed epoxy resin composition which comprises

(a) a liquid epoxy resin bearing an average of more than one vicinal epoxy group per molecule, and

(b) a small, but effective catalytic amount of formylmethylenetriphenylphosphorane or formylmethyltriphenylphosphonium halide.

6. An improved process for advancing a liquid epoxy resin bearing at least one vicinal epoxy group with a polyphenol to form a solid, essentially linear resin at about 50° C. to about 225° C. wherein the improvement comprises

carrying out the advancement reaction in the presence of a small, but effective catalytic amount of formylmethylene triphenylphosphorane or formylmethyltriphenylphosphonium halide.

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**4,389,521**

## PROCESS FOR PREPARING A CYCLIC AMIDE POLAR SOLVENT COMPOSITION

**Keizo Shimada; Hiroshi Mera, both of Iwakuni; Tsutomu Nakamura, Yamaguchi, and Akihiro Aoki, Iwakuni, all of Japan, assignors to Teijin Limited, Yamaguchi, Japan**

**Continuation-in-part of Ser. No. 131,642, Mar. 19, 1980, abandoned. This application Nov. 19, 1981, Ser. No. 322,892**

**Claims priority, application Japan, Mar. 26, 1979, 54-34214; Apr. 18, 1979, 54-46745**

**Int. Cl.³ C08G *69/26***

**U.S. Cl. 528—336** **29 Claims**

1. A process for preparing a cyclic amide polymer-amide polar solvent composition, which process comprises the steps of:

(A) prepolymerizing, in an amide organic polar solvent, at least one cyclic diamine selected from the group consisting of aromatic diamines and heterocyclic diamines which are neither ortho nor peri oriented, with at least one cyclic dicarboxylic acid chloride selected from the group consisting of aromatic dicarboxylic acid chlorides and heterocyclic dicarboxylic acid chlorides which are neither ortho nor peri oriented, in a molar equivalent less than that of said cyclic diamine, to prepare a prepolymer solution containing a by-product consisting of hydrogen chloride;

(B) removing at least a portion of said hydrogen chloride from said prepolymer solution by first neutralizing it with ammonia and, then, separating the resultant precipitate consisting of ammonium chloride from said prepolymer solution by means of filtration, to prepare a prepolymer filtrate;

(C) high polymerizing said prepolymer in said prepolymer solution with an amount of at least one cyclic dicarboxylic acid chloride selected from the group consisting of aromatic and heterocyclic dicarboxylic acid chlorides in addition to that used in the prepolymerizing step, to prepare a polyamide solution containing a by-product consisting of hydrogen chloride, and;

(D) converting the entire amount of said hydrogen chloride in said polyamide solution to a salt, which is soluble in said amide type polar solvent and capable of enhancing the solubility of said polyamide in said amide polar solvent, with a neutralizing agent, to provide a cyclic amide polymer composition, and which process is characterized in that:

(a) in said prepolymerization step (A), the resultant prepolymer solution exhibits a solution viscosity of 20 poise or less at a temperature of 50° C.;

(b) in said removing step (B), said first neutralizing procedure of said prepolymer solution with ammonia is carried out to such an extent that a mixture of 10 g of the resultant neutralized mixture with 200 ml of ion-exchanged water exhibits a pH of from 3.7 to 8.0, and;

(c) in said conversion step (D), 10 to 70% of the hydrogen chloride contained in said polyamide solution is also converted with said neutralizing agent into said amide polar solvent-soluble salt, and the entire amount of said amide polar solvent-soluble salt corresponds to from 5 to 95% by weight of the theoretical amount of said amide polar solvent-soluble salt to be derived from the entire amount of said cyclic dicarboxylic acid chloride used in said prepolymerization step (A) and said high polymerization step (C).

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**4,389,522**

## PROCESS FOR THE THERMAL AFTER-TREATMENT OF PASTE-FORMING POLYMERS OF VINYL CHLORIDE

**Burkhard Boeke, Haltern; Josef Kalka, Herten; Manfred Smolinski, Marl, and Heinz Baukholt, Dorsten, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls, A.G., Marl, Fed. Rep. of Germany**

**Filed Sep. 16, 1981, Ser. No. 316,018**

**Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034983**

**Int. Cl.³ C08F *6/14***

**U.S. Cl. 528—503** **8 Claims**

1. In a process for the thermal after-treatment of paste-forming homo- or copolymers of vinyl chloride, obtained by aqueous emulsion polymerization, followed by spray-drying to produce a spray dried powder, the improvement wherein 20 to 60 percent by weight of the spray-dried powder is warmed for 30 minutes to 1 second to a treating temperature of 75°–110° C. and, then is recombined with the non heat-treated, 80–40 percent by weight portion of the spray dried powder.

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**4,389,523**

## CELLULOSE SULFATE SALT HAVING ANTI-COAGULATING ACTION AND PROCESS FOR PREPARING SAME

**Kunihiko Okajima, Takatsuki; Kenji Kamide, Ikoma, and Toshihiko Matsui, Takatsuki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 25, 1981, Ser. No. 324,918**

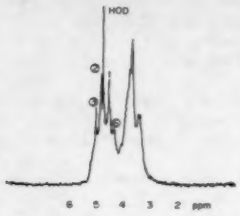
**Claims priority, application Japan, Nov. 27, 1980, 55-165786**

**Int. Cl.³ C08G *18/10***

**U.S. Cl. 536—59** **11 Claims**

1. A cellulose sulfate salt having a heparinic action, which satisfies the requirements of $0.8 \leqq \langle\langle F \rangle\rangle \leqq 2.6$, $\langle\langle f_2 \rangle\rangle \cdot \geqq \langle\langle f_3 \rangle\rangle$ and $\langle\langle f_2 \rangle\rangle \geqq \langle\langle f_6 \rangle\rangle$ wherein $\langle\langle f_2 \rangle\rangle$, $\langle\langle f_3 \rangle\rangle$ and $\langle\langle f_6 \rangle\rangle$ stand for probability of substitution of atoms H in OH groups bonded to the $C_2$, $C_3$ and

$C_6$ positions of the glucopyranose ring unit by sulfuric acid radicals, respectively, and <<F>> stands for the total substitution degree which is the sum of <<$f_2$>>, <<$f_3$>> and <<$f_6$>>.

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**4,389,524**

## CEPHAM COMPOUNDS

**Riccardo Scartazzini, Allschwil, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

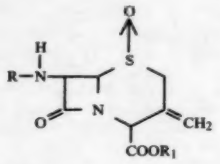
**Continuation-in-part of Ser. No. 373,819, Jun. 26, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,664**

**Claims priority, application Switzerland, Jun. 29, 1972, 9787/72; Dec. 22, 1972, 18721/72**

**Int. Cl.³ C07D *501/22*; A61K *31/545***

**U.S. Cl. 544—016** **12 Claims**

1. The compound of the formula



wherein R is phenoxyacetyl or phenylacetyl and $R_1$ is hydrogen, p-nitrobenzyl, p-methoxybenzyl, benzhydryl, or 2,2,2-trichloroethyl.

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**4,389,525**

## PROCESS FOR THE RESOLUTION OF SOME INTERPHENYLENE 9-THIA-11-OXO-12-AZAPROSTANOIC ACIDS

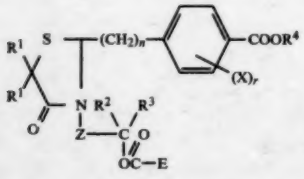
**Mark G. Bock, Hatfield, and Robert M. Di Pardo, Lansdale, both of Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Filed Jun. 22, 1981, Ser. No. 276,116**

**Int. Cl.³ C07D *277/04***

**U.S. Cl. 548—187** **3 Claims**

1. The diastereomer having the formula



wherein

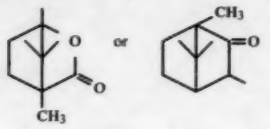
(1) X is chlorine or methyl;

(2) n is 0, 1 or 2;

(3) n is 3 or 4;

(4) $R^1$ is hydrogen, deuterium or methyl;

(5) E is



(6) $R^2$ is H or $C_1$–$C_3$ alkyl;

(7) $R^3$ is 4-pentenyl, 5,5,5-trifluoropentyl or $C_3$–$C_7$ alkyl and

(8) Z is $(CH_2)_2$, $(CH_2)_3$, cis or transpropenylene or propynylene.

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**4,389,526**

## INTERMEDIATES AND SYNTHESIS OF 2-AMINO-2-DEOXYTETRITOLS

**Milos Sovak, La Jolla, and Ramachandran Ranganathan, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.**

**Filed Aug. 3, 1981, Ser. No. 289,743**

**Int. Cl.³ C07D *321/06***

**U.S. Cl. 549—347** **9 Claims**

1. A method for preparing a 1,4-dihydroxyl protected -2-amino-2-deoxyerythritol which comprises:

combining a source of positive halogen of atomic number 17 to 80, a nitrile, aqueous base unreactive with alkylhalogen under the conditions of the reaction, and hydroxyl protected 1,4-dihydroxybutene-2 under mild conditions whereby trans-halo-acylamido is formed;

treating the trans-halo-acylamido with a mild aqueous base at an elevated temperature to produce cis-hydroxy-acylamido; and

treating the cis-hydroxy-acylamido with a basic deacylating agent above about 60° C. to produce the desired 1,4-dihydroxyl protected-2-amino-2-deoxyerythritol.

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**4,389,527**

## PROCESS FOR THE PREPARATION OF DIHYDROCINNAMALDEHYDE DERIVATIVES

**Roy H. Valentine, Caterham, Great Britain, and Harold A. Brandman, Glen Ridge, N.J., assignors to Givaudan Corporation, Clifton, N.J.**

**Filed Jun. 30, 1981, Ser. No. 278,968**

**Claims priority, application United Kingdom, Jul. 4, 1980, 8021949; Apr. 27, 1981, 8112923; Jun. 16, 1981, 8118538**

**Int. Cl.³ C07C *45/46***

**U.S. Cl. 549—438** **16 Claims**

1. A process for the manufacture of a 3-aryl propionaldehyde which comprises reacting an alken-2-ylidene diacylate or an $\alpha$-ethylenic aldehyde with an aromatic compound in the presence of trifluoroacetic acid.

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**4,389,528**

## TRIALKYLAMINE/SULFUR DIOXIDE CATALYZED SULFENYLATION OF CARBAMATES

**John W. Ager; Maurice J. C. Harding, both of Princeton, and Charles E. Hatch, III, Pennington, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.**

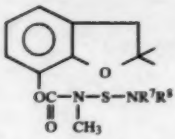
**Continuation-in-part of Ser. No. 202,526, Oct. 31, 1980, Pat. No. 4,329,293. This application Feb. 22, 1982, Ser. No. 350,792**

**The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.**

**Int. Cl.³ C07D *307/86***

**U.S. Cl. 549—470** **6 Claims**

1. A process for preparing a compound of the formula



which comprises, reacting carbofuran with a disubstituted aminosulfenyl halide of the formula $R^3SX$ in the presence of a solvent and acid acceptor in the presence of a catalytic amount of a complex of sulfur dioxide and a trialkylamine of the formula $R^4NR^5R^6$ wherein each of $R^4$, $R^5$ and $R^6$ is a lower alkyl group, wherein

(a) X is a halogen atom and $R^3$ is $—NR^7R^8$;

(b) one of $R^7$ and $R^8$ is a group of the formula $—CH_2CO_2R^9$ wherein $R^9$ is a lower alkyl group and, the other of $R^7$ and $R^8$ is a lower alkyl group or a group of the formula $—CH_2CO_2R^9$.

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**4,389,529**

## METHOD FOR EPOXIDIZING OLEFINS

**Charles J. Stark, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 263,839, May 15, 1981, Pat. No. 4,344,887, and a continuation-in-part of Ser. No. 107,899, Dec. 28, 1979, abandoned. This application Apr. 22, 1982, Ser. No. 370,763**

**Int. Cl.³ C07D *301/12***

**U.S. Cl. 549—531** **3 Claims**

1. An epoxidation method which comprises

(1) incrementally adding aqueous 30–90% by weight hydrogen peroxide to a refluxing mixture comprising an olefinically unsaturated organic material, symmetrical tetrachloroacetone, and an inert organic solvent,

(2) continuously azeotroping water of reaction from the mixture of (1) until the mixture is substantially free of water,

(3) washing the resulting organic solution of (2) with an aqueous base and

(4) distilling the inert organic solvent from the resulting solution of (3) to effect recovery of the epoxidized organic material.

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**4,389,530**

## PESTICIDALLY ACTIVE NOVEL PHOSPHORIC (PHOSPHONIC) ACID ESTER AMIDES

**Dieter Arlt, Cologne; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

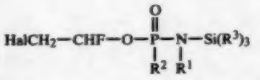
**Filed Feb. 26, 1982, Ser. No. 352,723**

**Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110596**

**Int. Cl.³ C07F *7/08, 7/18***

**U.S. Cl. 556—404** **13 Claims**

1. A phosphoric (phosphonic) acid ester amide of the formula



wherein

$R^1$ is hydrogen or optionally substituted alkyl,

$R^2$ is optionally substituted alkyl or optionally substituted alkoxy,

$R^3$ is optionally substituted alkyl, and

Hal is halogen.

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**4,389,531**

## PREPARATION OF N-SUBSTITUTED ANILINES

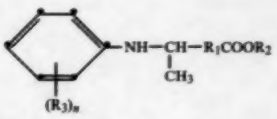
**Gary T. Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation-in-part of Ser. No. 158,748, Jun. 12, 1980, abandoned, which is a continuation of Ser. No. 26,481, Apr. 2, 1979, abandoned. This application Feb. 22, 1982, Ser. No. 350,936**

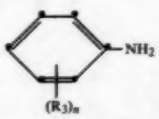
**Int. Cl.³ C07C *67/30***

**U.S. Cl. 560—43** **4 Claims**

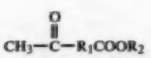
1. The process for the preparation of disperse dye couplers of the general formula



wherein $R_1$ is selected from straight or branched alkylene of 1–4 carbons, $R_2$ is selected from phenyl, cyclohexyl and straight or branched alkyl of 1–10 carbons which may be substituted with lower alkoxy, lower alkoxyalkoxy, benzyl, or cyclohexyl, and $R_3$ is selected from hydrogen, lower alkyl, lower alkoxy, lower alkanoylamino, and aryl, and n is 1, 2 or 3, comprising contacting at between about 75° C. and 200° C. under hydrogen at between about 100 and 3,000 psi a mixture of at least one amine compound of the formula



or its nitro precursor and at least one compound of the formula



in the presence of from about 0.1 to about 30 parts by weight of a hydrogenation catalyst per part by weight of the amine or its nitro precursor, and from about $5.3\times10^{-4}$ to about $1.0\times10^{-1}$ moles per mole of said amine or its nitro precursor of one or more of lower alkyl sulfonic acid, p-toluenesulfonic acid, benzenesulfonic acid, or naphthalene sulfonic acid, each of which may be substituted with 1–3 lower alkyl groups.

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**4,389,532**

## PROCESS FOR THE PREPARATION OF ACETALDEHYDE

**Thomas H. Larkins, Jr., and Guy R. Steinmetz, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 10, 1982, Ser. No. 376,975**

**Int. Cl.³ C07C *47/06***

**U.S. Cl. 568—487** **16 Claims**

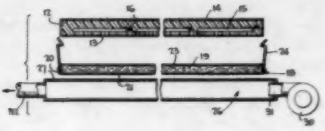
1. A process for the preparation of acetaldehyde from hydrogen, carbon monoxide, and methanol which comprises conducting the reaction at carbonylation temperature and pressure in the presence of a catalyst system comprising cobalt, platinum, and iodide.

4,389,533

## PHOTOVOLTAIC DEVICE FOR PRODUCING ELECTRICAL AND HEAT ENERGY

Douglas A. Ames, 1301 20th St., NW., Washington, D.C. 20036

Filed Mar. 9, 1981, Ser. No. 242,101
Int. Cl.³ H01L 31/04
U.S. Cl. 136—248 9 Claims



1. A photovoltaic device for transforming light energy into usable electrical energy and heat energy, comprising

(a) a solar panel having a bottom and side walls forming a tray with an open front to receive light;

(b) photovoltaic cells positioned in said tray beneath said open front, said cells having light-receiving, upwardly facing surfaces and electrical contacts for collecting and channeling electrical energy generated by said cells to perform work, said bottom of said tray being formed of material that allows heat to pass through it so that heat also generated during operation of said cells passes to and through said tray bottom, and

(c) a container housing salt hydrate materials that are solid at ambient temperatures of use of said solar panel and can be melted by the heat generated during operation of said photovoltaic cells, said container being releasably positioned in proximity to said tray bottom, so that heat generated during the operation of said photovoltaic cells will pass to and through said bottom and melt said salt hydrate materials, thereby effectively storing heat in said materials and lowering the operating temperature of said photovoltaic cells.

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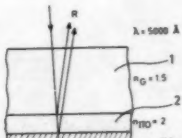
4,389,534

## AMORPHOUS SILICON SOLAR CELL HAVING IMPROVED ANTIREFLECTION COATING

Gerhard Winterling, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,999
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048381
Int. Cl.³ H01L 31/04
U.S. Cl. 136—256 1 Claim




1. A semiconductor component for the conversion of light to electric energy, comprising at least one layer of amorphous silicon, a cover layer of poly-crystalline silicon, and an anti-reflection layer of semiconducting transparent oxide of a refractive index less that 2.8, said cover layer of poly-crystalline silicon having an optical density of

$$\frac{\lambda_{light}}{4} \text{ or } \frac{3\lambda_{light}}{4}$$

and being arranged between said anti-reflection layer and said layer of amorphous silicon.

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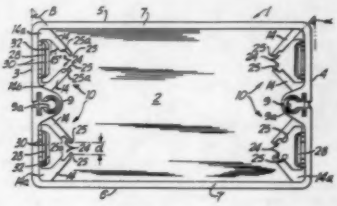
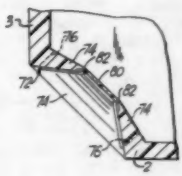
4,389,535

## CABLE ENTRY PORT MEANS FOR ELECTRICAL OUTLET BOX

Thomas S. Slater, Port Washington, and Wade R. Bowden, Jr., Northport, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Division of Ser. No. 22,993, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 879,767, Feb. 21, 1978. This application Apr. 27, 1981, Ser. No. 257,814
Int. Cl.³ H02G 3/08
U.S. Cl. 174—65 R 6 Claims





1. In an electrical outlet box having a wall structure providing front to rear wall means and a bottom wall interconnected therebetween, the front to rear wall means and bottom wall defining a chamber within the wall structure which opens through the front of the box, and wherein said wall structure houses cable entry port means for the passage of electrical power cable into said box chamber, the improvement therein which comprises, said cable entry port means including:

said front-to-rear wall means and said bottom wall being interconnected by an intermediate wall portion extending generally diagonally therebetween,

at least one aperture located in said diagonally extending intermediate wall portion having a plural-sided configuration;

closure panel means depending from the rim of said aperture and extending angularly inwardly from the plane of said aperture,

said closure panel means comprises a plurality of closure panels converging angularly inwardly toward each other from each side rim of said plural-sided aperture,

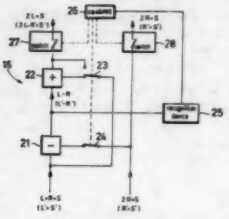
the convergent inner free ends of said plurality of converging closure panels separated by a distance less than the narrowest dimension of said electrical power cable; and

said free end portions of said closure panels adapted to deflect away from each other upon passage of said cable into said aperture and to thereafter resistingly bear against the installed cable.

## 4,389,536
## RECEIVER FOR A TWO CHANNEL TELEVISION SOUND

Willi Schickedanz, Langener Strasse 70, 6050 Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 190,639
Int. Cl.[3] H04N 5/60
U.S. Cl. 179—1 G 11 Claims



1. In a receiver for receiving TV sound signals, said sound signals being transmitted by means of a first and a second channel:

(a) decoder means having a first and a second input as well as a first and second output, the first input being supplied with the signal of the first channel and the second input being supplied with the signal of the second channel;

(b) subtractor means for subtracting the signal of the second input of the decoder from the signal of the first input of said decoder;

(c) adder means for adding the output signal of the subtractor means to the signal of the first input of the decoder;

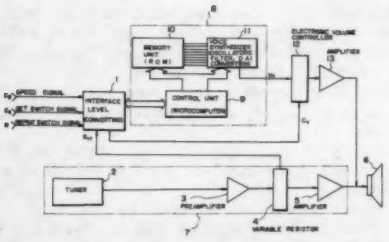
(d) means for connecting the output of the adder means to the first output of the decoder and

(e) means for connecting the second input of the decoder to the second output of said decoder.

## 4,389,537
## VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE PROVIDED WITH AN AUTOMATIC SPEED CONTROL DEVICE

Masakazu Tsunoda, Fujisawa, and Kazuyuki Mori, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 3, 1980, Ser. No. 193,814
Claims priority, application Japan, Oct. 4, 1979, 54-127357
Int. Cl.[3] G10L 1/00
U.S. Cl. 179—1 SM 6 Claims



1. A voice warning system for an automotive vehicle provided with an automatic speed control device, which comprises:

(a) a vehicle speed sensor for detecting vehicle speed and for outputting a vehicle speed signal $S_p$;

(b) a set switch provided for the automatic speed control device for setting the vehicle to travel at a constant speed under control of the automatic speed control device, and for outputting a set switch signal $S_s$;

(c) a voice synthesizing system responsive to the vehicle speed and set switch signals for reading the speed signal output by said vehicle speed sensor in response to said set switch signal output by said set switch, and for outputting a voice form output message in accordance with the detected vehicle speed signal;

(d) an interface for controlling the connections of the vehicle speed signal and the set switch signal to the voice synthesizing system;

(e) a volume control for a car-radio in the vehicle, said volume control generating a sound volume signal connected to said interface;

(f) said interface including means for generating a voice volume control signal corresponding to said sound volume signal; and

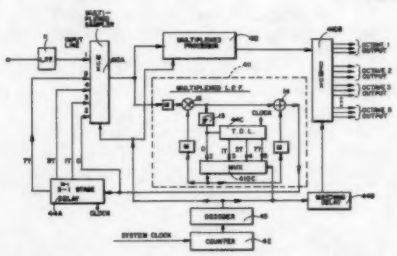
(g) an electronic volume control for adjusting the voice volume of the voice form output message in accordance with the voice volume control signal generated by said interface,

whereby the vehicle speed is indicated to the driver as a voiced message having a volume level according to the car-radio sound volume as adjusted by driver preference, when said set switch is turned on.

## 4,389,538
## MULTIPLEXER FOR SINGLE-OCTAVE DATA PROCESSOR

Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 12, 1981, Ser. No. 224,401
Int. Cl.[3] G10L 1/00
U.S. Cl. 179—1 SA 8 Claims



1. Multiplexing means for allowing multi-octave processing of sampled data by means of a single octave data processor and comprising:

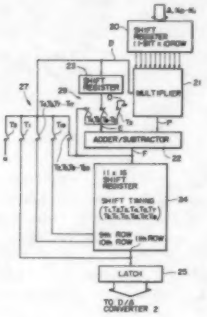
means for progressively delaying said sampled data, corresponding to delay coding thereof so that delay-coded data is produced by said means for delaying; and

multiplex means for producing multiplexed sampled data by progressively sampling said delay-coded data from said means for delaying at progressively reduced data sampling rates, corresponding to lower octaves of interest, so that said multiplexed sampled data includes interleaved samples corresponding to a plurality of octaves for processing by said single octave data processor.

## 4,389,539
## DIGITAL FILTER FOR PERFORMING SERIAL OPERATIONS AND VOCAL SOUND SYNTHESIZING APPARATUS HAVING THE DIGITAL FILTER

Taisuke Watanabe; Katsuyuki Niyada, both of Sagamihara; Shoji Hiraoka, and Kenji Kaga, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Mar. 10, 1981, Ser. No. 242,191
Claims priority, application Japan, Mar. 12, 1980, 55-31797
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SM 7 Claims




1. A digital filter for filtering a digital exciting input signal by modifying the digital exciting input signal with various parameters, comprising:

(a) means for storing a plurality of filter factors applied as said various parameters;

(b) a serial multiplier having a set of first inputs responsive to the output data of said storing means, a second input and an output;

(c) an adder/subtractor having a first input responsive to the output data of said multiplier, a second input and an output;

(d) a first delay circuit for retarding the output data of said adder/subtractor;

(e) latch means for temporarily storing the output data of said first delay circuit so as to effect series/parallel conversion;

(f) a first selecting means for selecting one of the following circuits: the first delay output; the adder/subtractor output; or said digital exciting input signal; so that selected data are fed to said second input of said multiplier;

(g) a second delay circuit for retarding the output data of said first selecting means; and

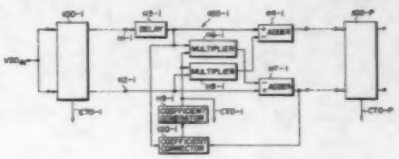
(h) a second selecting means for selectively applying the output data of said second delay circuit to said second input of said adder/subtractor;

said serial multiplier, said adder/subtractor, said first and second delay circuits, said latch, said first and second selecting means being all arranged such that data transmission from said first selector to said second input of said serial multiplier and to said second delay circuit, from said second delay circuit to said second selecting means, from said serial multiplier to said first input of said adder/subtractor, from said second selecting means to said second input of said adder/subtractor, from said adder/subtractor to said first delay circuit, from said first delay circuit to said first selecting means, and from said first delay circuit to said latch means are all effected serially.

## 4,389,540
## ADAPTIVE LINEAR PREDICTION FILTERS

Makoto Nakamura, Kanagawa, and Fumio Sugiyama, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 19, 1981, Ser. No. 245,435
Claims priority, application Japan, Mar. 31, 1980, 55-41574
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1.5 A 31 Claims




1. A voice analyzing apparatus comprising a plurality of cascade-connected delay filter circuit each including:

a delay circuit connected to delay an input signal received at a first input terminal by a predetermined period of time;

a variable coefficient generating circuit;

a first multiplier circuit connected to produce an output signal corresponding to the product of output signals from said delay circuit and said variable coefficient generating circuit;

a second multiplier circuit connected to produce an output signal corresponding to the product of output signals from said delay circuit and said variable coefficient generating circuit and an input signal received at a second input terminal;

a first adder circuit connected to produce an output signal coresponding to the sum of or the difference between output signals from said delay circuit and said second multiplier circuit;

a second adder circuit connected to produce an output signal corresponding to the sum of or the difference between the output signal from said first multiplier circuit and an input signal received at said second input terminal; and

a coefficient correction circuit connected to said variable coefficient generating circuit and including a first coefficient control signal generating circuit having two inputs connected to the output terminals of said delay circuit and said second adder circuit to produce a coefficient control signal to change a coefficient output signal from said variable coefficient generating circuit to suppress an output signal from said second adder circuit to the minimum and an attenuator circuit connected to attenuate the coefficient control signal generated from said coefficient control signal generating circuit.

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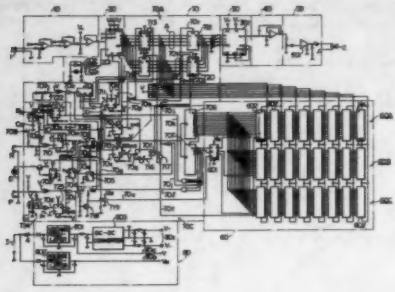
## 4,389,541
## VEHICLE-MOUNTED MESSAGE APPARATUS

Osamu Nakano, and Kunihiro Sowa, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 15, 1981, Ser. No. 254,496
Claims priority, application Japan, Apr. 18, 1980, 55-52186
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SM 14 Claims

1. A vehicle-mounted message apparatus comprising a recording switch; a converter enabled responsive to an actuation of said switch for converting an applied voice message into an electrical signal; memory means for recording and holding data corresponding to said electrical signal; sensor means for sensing a vehicle starting condition and generating a start signal; and reproduction means responsive to the start signal

for reading out the data held in the memory means to convert to an output voice; whereby an optional message recorded by



a prior driver can be communicated to a present driver in voice form when the present driver is ready to drive.

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**4,389,542**

## ORTHODYNAMIC HEADPHONE

**Rudolf Görike, Vienna, Austria, assignor to AKG Akustische u. Kino-Geräte, Austria**

**PCT No. PCT/AT80/00026, § 371 Date Apr. 23, 1981, § 102(e) Date Apr. 21, 1981, PCT Pub. No. WO81/00660, PCT Pub. Date Mar. 5, 1981**

**PCT Filed Aug. 18, 1980, Ser. No. 261,151**

**Claims priority, application Austria, Aug. 23, 1979, 5675/79**

**Int. Cl.³ H04R *3/00, 9/06, 19/04***

**U.S. Cl. 179—1 R** **12 Claims**

1. A headphone having earpieces which each comprise at least one electroacoustic transducer operating on the isodynamic principle and including a small-mass diaphragm corresponding at least to the area of an average auricle, with a coupling space of each of the earpieces being designed for minimum sound reflection, characterized in that in order to effect a coupling to the ear, a cushion of reticulate foam material is provided bounding the coupling space at least laterally and having an acoustic frictional resistance which, with the cushion resting in a use position to form the coupling space, is approximately on the order of magnitude of the transformed wave impedance of air, so that the diaphragm oscillation is impeded predominantly by friction and a critical damping of the low-frequency resonance of the diaphragm is established.

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**4,389,543**

## TELEPHONE-ACTIVATED AUDIO CONTROL CIRCUIT

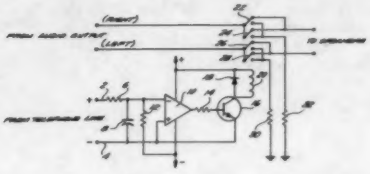
**Martus Granirer, 100 S. Mountain Rd., New City, N.Y. 10956, and Andrew Jason, Miami, Fla., assignors to Martus Granirer, New City, N.Y.**

**Filed Dec. 18, 1980, Ser. No. 217,998**

**Int. Cl.³ H04M *11/00***

**U.S. Cl. 179—2 B** **9 Claims**

1. A circuit for use with telephone lines and the like, designed to mute an audio source after a telephone receiver has been taken off the hook, comprising: a high-impedance front end which can be connected across a telephone line and which can respond to voltage changes thereacross; a comparator connected to the front end and comparing voltage across the telephone line to a voltage reference source, the comparator having an output at which a control voltage proportional to a



difference between the voltage reference source and voltage across the telephone line appears; and control means coupled to the output of said comparator and connected to said audio source to activate or deactivate the source in response to changes in said control voltage.

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**4,389,544**

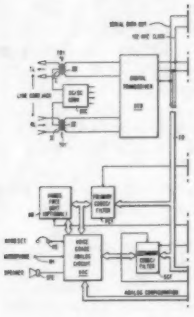
## DIGITAL TELEPHONE APPARATUS

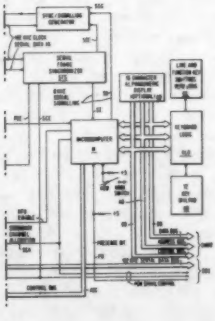
**Theodore W. Wagner, West Palm Beach; Sam Liang, Deerfield Beach, both of Fla., and Deepak R. Muzumdar, Somerset, N.J., assignors to Siemens Corporation, Iselin, N.J. and Siemens Corporation, Iselin, N.J.**

**Filed Mar. 31, 1981, Ser. No. 249,400**

**Int. Cl.³ H04M *11/06;* H04J *3/06***

**U.S. Cl. 179—2 DP** **39 Claims**





1. Digital telephone apparatus suitable for subscriber stations and attendant consoles and adapted to be connected for com-

munication with a telephone transmission line, said apparatus comprising, in combination:

(a) an internal data bus;

(b) a digital transceiver connected to said internal data bus and adapted to be connected to said telephone transmission line for receiving and transmitting digital speech data, signalling data and other information via said transmission line and also via said internal data bus, said digital transceiver including means for transmitting and receiving signals on said transmission line which correspond to digital data received and transmitted, respectively, on said data bus;

(c) a sync/signalling generator connected to said internal data bus for repeatedly generating and passing to said data bus a first data word containing a binary synchronizing code and a signalling code;

(d) a serial frame synchronizer connected to said internal data bus for repeatedly receiving from said data bus and decoding a first data word containing a synchronizing code and a signalling code;

(e) a microcomputer connected to said sync/signalling generator and to said serial frame synchronizer for repeatedly transmitting binary signalling information to said sync-/signalling generator for formation of said first data word to be transmitted, and for repeatedly receiving binary signalling information from said serial frame synchronizer that has been decoded from a received first data word;

(f) input/output means connected to said microcomputer for entering input information into, and indicating output information received from said microcomputer, said microcomputer being operative to translate between said signalling information and said input and output information;

(g) a first codec/PCM filter connected with said internal data bus for converting a second data word appearing on said data bus into an analog voice signal and converting an analog voice signal into a second data word for transmission on said data bus.

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**4,389,545**

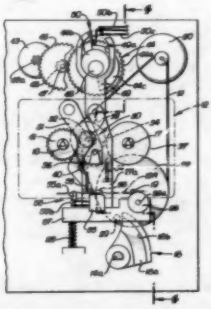
## REMOTE REWIND MECHANISM AND CONTROL CIRCUITRY FOR A TAPE CASSETTE TELEPHONE ANSWERING DEVICE

**Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406**

**Filed Dec. 29, 1980, Ser. No. 220,359**

**Int. Cl.³ H04M** *1/64*

**U.S. Cl. 179—6.07** **6 Claims**



1. A telephone answering device in which incoming messages from a telephone line are recorded on a cassette tape, and in which previously recorded incoming messages can be played back under remote control upon receipt of a remote control signal from said telephone line, the improvement comprising:

a carriage movable between a cassette tape engaging position and a disengaged, rewind position, said carriage carrying the playback head and pinch roller for said tape, said carriage being biased into the tape engaging position,

drive transfer means, linked to the movement of said carriage, for transferring motor imparted tape driving force from the cassette takeup reel spindle to the supply reel spindle when said carriage is moved to said disengaged, rewind position, and

cam motor driven lost motion linkage means including a lost motion linkage coupled to said carriage, and a motor driven cam operatively engaging said lost motion linkage and positionable between first and second cam orientations, the lost motion of said linkage permitting unimpeded manual retraction of said carriage when said cam is in said first orientation, receipt of said remote control playback signal causing said cam to be motor driven to said second orientation in which said lost motion linkage urges said carriage against the bias thereof into said disengaged, rewind position.

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**4,389,546**

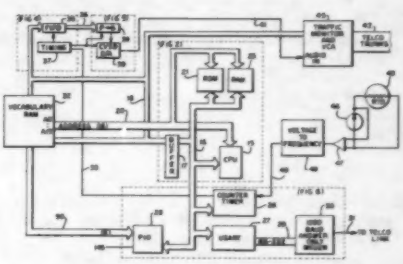
## DIGITAL ANNOUNCEMENT SYSTEM INCLUDING REMOTE LOADING AND INTERROGATION

**David Glisson, Lawrenceville; Gerald Huber, Snellville, and Bruce Biskey, Norcross, all of Ga., assignors to The Audichron Company, Atlanta, Ga.**

**Filed Mar. 23, 1981, Ser. No. 246,733**

**Int. Cl.³ H04M** *3/50, 15/00*

**U.S. Cl. 179—18 B** **2 Claims**



1. In an automatic time of day announcement system for providing time of day announcements to at least one telephone truck in response to an incoming call, including a clock comprising time base means for providing a time base signal of nominally constant frequency and scaling means for dividing said time base signal by a scale to provide a time of day signal stored in a time of day register, the improvement comprising:

interface means for connecting a control trunk and said clock means in response to a first sequence of pre-determined signals provided on said control trunk from a remote location; and

scale correcting means responsive to a second sequence of predetermined signals occurring on said control trunk subsequent to said interface means connecting said clock means, to change said scale of said scaling means.

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**4,389,547**

## TELEPHONE SET

**Friedrich L. Jansen, Hilversum, Netherlands, and Ian Phillips, Sherston Near Malmesloury, England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 15, 1980, Ser. No. 187,113**

**Claims priority, application United Kingdom, Sep. 17, 1979, 7932107**

**Int. Cl.³ H04M** *1/00*

**U.S. Cl. 179—81 R** **6 Claims**

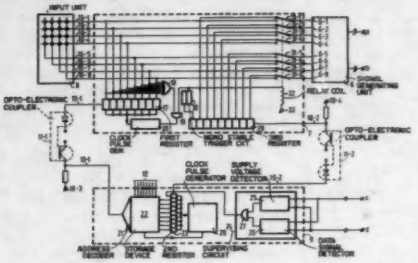
1. A telephone set comprising:

an input unit,

a signal generating unit coupled to a first pair of connecting terminals for connection to a first pair of wires of a subscriber's line,

an information processing unit under the control of said input unit for processing information signals from said input unit for use in said signal generating unit, and

a switching unit which is connected to said input unit and said signal generating unit for receiving information signals from said input unit and said information processing unit,



said information processing unit comprising a supervisory circuit for supervising the operation of said information processing unit, said switching unit coupling said input unit to said information processing unit under the control of said supervisory circuit when said information processing unit operates to convert information to be transmitted, said switching unit coupling said input unit to said signal generating unit when said information processing unit fails to transmit the information signals supplied by said input unit.

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**4,389,548**

**ACOUSTIC TRANSDUCER**

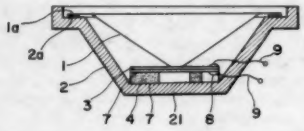
**Eiji Morikawa, Neyagawa; Toshifumi Morita, Osaka, and Masayuki Hirate, Takatsuki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Mar. 27, 1981, Ser. No. 248,330**

**Claims priority, application Japan, Sep. 11, 1980, 55-130588[U]**

**Int. Cl.³ H04R** *15/00*

**U.S. Cl. 179—110 A** **4 Claims**



1. An acoustic transducer including a piezoelectric element comprising:

a frame body having a space defined by a flat bottom portion of a predetermined area, a side frame connected with the peripheral edge of the bottom portion and a flange formed integrally with the free end of the side frame,

a cushioning means having a bottom face and a top face, said bottom and top faces having an adhesive layer formed thereon prior to the assembly of said acoustic transducer, the bottom face thereof being fitted on the upper surface of the bottom portion,

a piezoelectric element mounted on the top face of the cushioning means, and

a speaker diaphragm with an apex having an axially movable portion formed in a conical form in cross-section along the axis, the apex portion of the diaphragm being attached to the central portion of the upper face of the piezoelectric element,

wherein said cushioning means has an outer diameter equal to or less than the diameter of the flat bottom face of the frame body and wherein said cushioning means is adhered onto the top face of the bottom portion of the frame body by means of the adhering layer formed on the bottom face thereof and said cushioning means is adhered to the piezoelectric element by means of the adhering layer formed on the top face thereof such that the apex portion of the speaker diaphragm is secured to the central portion of the piezoelectric element, said piezoelectric element having been previously secured to said cushioning means, with the peripheral edge of the speaker diaphragm being secured to the flange of the frame body, said cushioning means further includes at least one cut portion and/or through hole thereby decreasing the energy absorbed in the cushioning means from the piezoelectric element.

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**4,389,549**

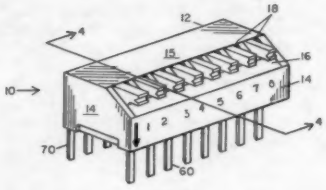
**SIDE ACTUATED MINIATURE DIP SWITCH**

**Richard P. Brown, Paso Robles, Calif., assignor to CTS Corporation, Elkhart, Ind.**

**Filed Nov. 23, 1981, Ser. No. 323,919**

**Int. Cl.³ H01H** *19/04*

**U.S. Cl. 200—5 R** **13 Claims**



1. A miniature DIP switch comprising a housing having a plurality of walls and a base defining a cavity and an arcuately shaped boss disposed within said cavity, electrically conductive movable contact arms disposed within the cavity and providing first contacts, first terminals each integral with a respective movable contact arm and supported by the housing, stationary contact arms disposed within the cavity, second terminals each integral with an end of a stationary contact arm and supported by the housing, said electrically conductive movable contact arms and stationary contact arms in respective aligned sets and in spaced apart relationship, and insulative rotatable lever actuators each having an arcuate bearing surface engaging the arcuately shaped boss, bearing means, and cam means, each actuator being interposed between a respective movable contact arm and the boss whereby said bearing means is disposed adjacent the base and said cam means engages said respective movable contact arm so that rotation of said actuator about the arcuately shaped boss biases said respective movable contact arm into wipable engagement or disengagement with its aligned stationary contact arm.

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**4,389,550**

**SWITCH ACTUATING MECHANISM**

**John J. Reiter, 6521 Stevens Ave. S., Minneapolis, Minn. 55423**

**Continuation-in-part of Ser. No. 195,407, Oct. 9, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,877**

**Int. Cl.³ H01H** *3/16, 3/20, 9/28*

**U.S. Cl. 200—44** **17 Claims**

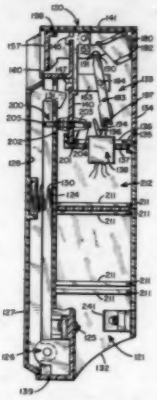
1. A switch actuating mechanism to be used with electrical motor driven apparatus for facilitating the energization and deenergization thereof, comprising, in combination:

(a) an electrical junction box for containing an electrical switch to be actuated, said electrical switch having at least

one operating lever extending through a top surface of said box;

(b) a broad surface member of a predetermined length and width dimension pivotally coupled to said junction box;

(c) a housing affixed to said top surface of said electrical junction box having mating mutually perpendicular top, front and side walls, said front wall being of a height less than said side walls to define an opening;



(d) a push button member of a relatively small size compared to said broad surface member mounted for reciprocal movement within said opening of said housing;

(e) means coupling said push button member to said operating lever for moving said lever to an "on" position when said push button member is depressed; and

(f) means coupling said broad surface member to said switch operating lever for moving said lever to an "off" position when said broad surface member is depressed.

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**4,389,551**

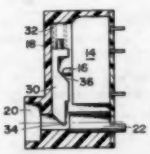
## PROBE-ACTUATED GUARD SHIELD SWITCH

**Florian C. Deibele, Portland, and William F. Schell, Banks, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.**

**Filed Jul. 13, 1981, Ser. No. 282,761**

**Int. Cl.³ H01H** *9/22*

**U.S. Cl. 200—51 R** **4 Claims**



1. A guard voltage input device having a probe-actuated switch which automatically disconnects a guard shield from a signal input line upon insertion of a probe tip into said device and automatically reconnecting said guard shield to said signal input line upon removal of said probe tip, comprising:

a non-conductive housing having a probe tip insertion opening therein;

a receptacle axially aligned with said opening for receiving said probe tip, said receptacle electrically connectable to said guard shield;

a switch disposed in said housing, said switch having a first terminal electrically connectable to said signal input line and a second terminal electrically connectable to said guard shield; and

a spring-biased actuating member disposed at a substantially right angle to the central axis of said receptacle, said member being engaged by said probe tip as it is inserted and being displaced thereby, opening said switch.

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**4,389,552**

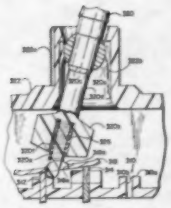
## SWITCH CONSTRUCTION

**Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.**

**Division of Ser. No. 234,664, Feb. 11, 1981, Pat. No. 4,347,417. This application Dec. 9, 1981, Ser. No. 328,828**

**Int. Cl.³ H01H** *5/06, 21/42*

**U.S. Cl. 200—68** **7 Claims**



1. A switch comprising a base defining an upwardly open cavity, a plurality of fixed contacts spaced along the bottom wall of said base cavity, said switch having means defining a top opening with an inwardly facing bearing surface, a movable actuator having a depending portion and having shoulder means engaging said bearing means, at least one movable contact element slidably received inside said switch base cavity for movement generally across the upper ends of said fixed contacts to selectively bridge certain of said fixed contacts, said movable contact element having at least one upwardly open recess to receive said depending portion so that said element moves in response to actuator movement, and spring means retained by said depending actuator portion for biasing said movable contact element toward engagement with said fixed contacts and for biasing said actuator defined shoulder means into engagement with said inwardly facing bearing surface for said actuator.

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**4,389,553**

## ROTARY DISCONNECT SWITCH

**Werner König, Heddesheim; Wolfgang Wagenbach, Linsengericht; Hans May, Bad Durkheim, and Rolf Bleidt, Hanau, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany**

**Filed Jun. 18, 1980, Ser. No. 160,560**

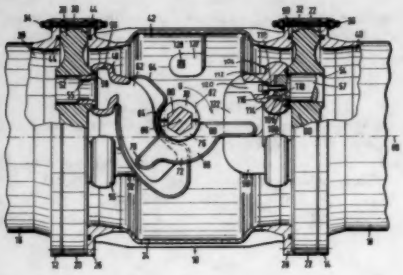
**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924630**

**Int. Cl.³ H01H** *33/60*

**U.S. Cl. 200—148 H** **17 Claims**

1. Rotary disconnect switch assembly, comprising a metal encapsulation insulated with $SF_6$ gas, flanges integral with said encapsulation, support insulators disposed on said flanges, a drive shaft passing through said encapsulation and having a portion disposed outside and a portion disposed inside said encapsulation, a drive connected to said outside portion of said drive shaft for rotating said drive shaft, a profile formed on said inside portion of said drive shaft, three disconnect blades fastened side by side in axial direction on said inside portion of said drive shaft, intermediate pieces passing through said support insulators from within said encapsulation and being connectible to phase conductors leading outwardly from said support insulators, and an opposite pair of first and second fixed contacts for each individual phase connected along said

intermediate pieces in said encapsulation in axial direction of said drive shaft, said blades being rotatable with said drive



shaft between an on position in which they connect said first and second contacts to each other and a disconnect position.

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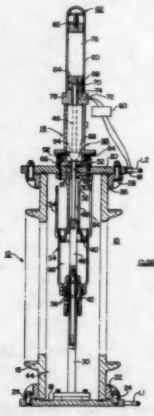
**4,389,554**

**TRANSFORMER PROTECTIVE SWITCH**

**Willie B. Freeman, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 26, 1980, Ser. No. 163,131**
**Int. Cl.³ H01H *33/88***
**U.S. Cl. 200—148 A** **7 Claims**



1. An electric switch comprising:
a stationary contact;
a movable contact operable between open and closed positions with respect to said stationary contact;
means for moving said movable contact during an opening operation comprising:
an operator shaft directly coupled at one end to said movable contact and having a piston at the other end thereof;
an operator cylinder having disposed therein said piston;
a chemical operator extending into said operator cylinder and being longitudinally disposed intermediate said piston and said movable contact, said chemical operator, upon activation, igniting and generating a hot gas within said operator cylinder and against said piston to cause movement thereof, movement of said piston causing movement of said movable contact through said operator shaft; and
means for activating said chemical operator; and
means for inserting pressurized air against said piston distal from said movable contact to move said piston, and said movable contact through said operator shaft, during a closing operation.

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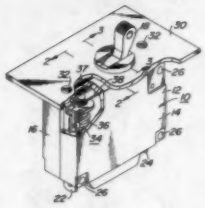
**4,389,555**

**CIRCUIT BREAKER WITH INCREASED ELECTRICAL SPACING**

**Thomas Guinan, Hamilton Township, Mercer County, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.**

**Filed Apr. 5, 1982, Ser. No. 365,516**
**Int. Cl.³ H07H *9/04***
**U.S. Cl. 200—303** **4 Claims**



1. In a circuit breaker the combination of a case,
two half-cases abutting together to jointly form said case,
a link including a handle accessible to an operator,
an electromagnetic device within said case,
said electromagnetic device including a portion which is electrically energized and closest to the outside of the circuit breaker,
a mechanism within said case operated by said handle,
said half-cases defining an opening through which said handle extends,
said half-cases having abutting, interfitting tongue and groove portions adjacent to said operator accessible handle to increase the creepage and clearance distances from outside the circuit breaker to said portion which is electrically energized and closest to the outside of the circuit breaker.

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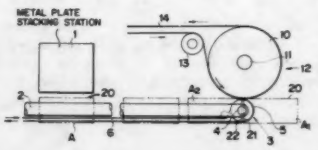
**4,389,556**

**METHOD FOR ELECTRIC RESISTANCE SEAM WELDING OF THE SIDE OVERLAPPED PORTION OF A TUBULAR FORM**

**Tetuo Nozawa, Shizuoka; Jun Nagata, Koganei, and Michiyuki Kakimoto, Shimizu, all of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan**

**Filed Sep. 1, 1981, Ser. No. 298,526**
**Claims priority, application Japan, Sep. 19, 1980, 55/130207**
**Int. Cl.³ B23K *1/16, 11/06, 9/00***
**U.S. Cl. 219—64** **7 Claims**




1. A method for electric resistance seam welding of the side overlapped portion of tubular forms made of thin steel plate, the tubular forms having front and rear edge parts and a central

part between the front and rear edge parts, the method comprising the steps of:

a. successively passing the overlapped portion of each of the tubular forms between welding electrodes such that before the overlapped portion of a preceding tubular form has passed out from between the welding electrodes, the overlapped portion of a following tubular form is inserted between the welding electrodes; and

b. applying a current to the welding electrodes so as to successively subject the overlapped portion of each of the tubular forms to electric resistance seam welding while between the welding electrodes;

c. the step of applying a current including the steps of applying a first welding current having a first magnitude to the welding electrodes while the central part of the tubular forms is between the welding electrodes, such that substantially no burrs are formed along the overlapped portion thereof, and apply a second welding current having a second magnitude greater than the first magnitude to the welding electrodes while the front and rear edge parts are between the welding electrodes.

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**4,389,557**

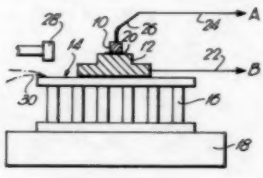
## SEMICONDUCTOR LASER BONDING TECHNIQUE

**Tibor F. Devenyi, Nepean; Tibor F. I. Kovats, Ottawa, and Christopher M. Look, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Aug. 17, 1981, Ser. No. 293,112**

**Int. Cl.³ H01L *21/58***

**U.S. Cl. 219—85 CM** **14 Claims**




1. A method of bonding a semiconductor laser chip to a heatsink comprising depositing solder on the heatsink, positioning and pressing the chip onto the solder, passing a small fixed current through the laser chip, applying regulated heat to the heatsink to render the solder molten, measuring a change in voltage across the laser chip caused by such heating to determine the temperature of a pn junction of said laser chip, regulating the applied heat on the basis of that predetermined temperature, and cooling the solder to render it solid and to bond the laser chip to the heatsink.

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**4,389,558**

## METHOD FOR MAKING A BELLOWS UNIT

**Jorn M. Schmidt, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

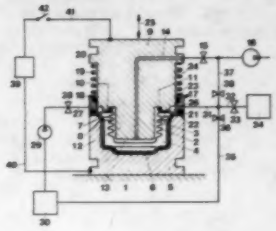
**Filed May 1, 1981, Ser. No. 259,682**

**Claims priority, application Fed. Rep. of Germany, May 5, 1980, 3017138**

**Int. Cl.³ B23K *11/30***

**U.S. Cl. 219—119** **3 Claims**

1. A method for assembling a bellows unit of the type having a cup shaped housing and disposed in spaced and nested relation thereto a corrugated cup shaped diaphragm having a rigid annular flange, said assembling involving pressure welding said flange to said housing, said method comprising the steps of providing a bottom electrode having a cavity for receiving and supporting a housing, providing an upper electrode having a central projection which protrudes into said diaphragm and a surrounding collar for biasing said diaphragm flange into abutting engagement with the upper edge of said housing, providing suction means including passage means in said electrode projection to provide a partial vacuum for drawing said diaphragm into engagement with said upper electrode projection, providing sealing means between said upper and lower electrodes, providing filling medium passage means in said apparatus extending from said cavity to a point externally thereof, filling said cavity including the space between said housing and said diaphragm with a filling medium via said filling medium passage means, and joining said housing and said diaphragm to form a bellows unit with a portion of said filling medium being sealed internally therein.



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**4,389,559**

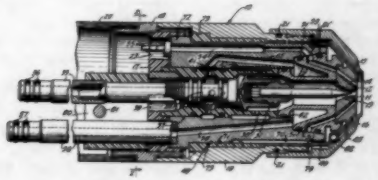
## PLASMA-TRANSFERRED-ARC TORCH CONSTRUCTION

**Anthony J. Rotolico, Hauppauge, and Eduardo Romero, Coram, both of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.**

**Filed Jan. 28, 1981, Ser. No. 229,275**

**Int. Cl.³ B23K *28/00, 9/00***

**U.S. Cl. 219—121 PP** **21 Claims**



1. A plasma-transferred-arc torch construction comprising an elongate central cathode subassembly having a downstream-directed cathode-discharge end and a radial mounting shoulder at an upstream mounting region thereof, an elongate insulating sleeve forming part of said subassembly downstream from said shoulder; a tubular mounting subassembly including a radially extending base of insulating material at said region and having a central bore through which the upstream end of said cathode assembly extends, with said shoulder in axial reference to said base; and an annular anode subassembly adapted for axial reference to said base via said sleeve and having a bore removably supported by said sleeve, said anode subassembly being convergent at its downstream end for axially overlapped radially spaced coaction with said cathode-discharge end; said tubular mounting subassembly including elongate outer tubular structure fully surrounding said cathode and anode subassemblies and having a convergent annular downstream end overlapping but in spaced relation to the convergent end of said anode subassembly, said outer tubular structure having axially adjustable threaded reference to said base, and angularly spaced insulating spacer elements of limited angular extent in the space between said convergent ends and adapted for insulated compressional loading upon threaded

adjustment of said outer tubular structure to retain the base reference of both said cathode and anode subassemblies, and said anode subassembly including shielding-gas supply-passage means communicating with the convergent space between said convergent ends, whereby said convergent space serves both as a manifold for shielding-gas flow and as a convergent nozzle for discharge of shielding gas around an externally transferred arc discharge downstream from and between said cathode and anode subassemblies.

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4,389,560

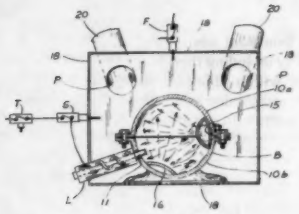
LASERS

Wilbur A. E. Mitchell, 1329 - 11th Ave., Greeley, Colo. 80631

Filed Apr. 10, 1981, Ser. No. 253,034

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 L 2 Claims



1. In combination, a laser heater enclosed furnace having, an iron heater fire pot therein, an operable electrically controlled laser light of upwards of 20,000 watts associated with the fire pot and adapted on light operation to project its light beam into the fire pot, a reflector mirror within the fire pot in position and adapted to reflect the laser light beam within the fire pot on laser operation, temperature electric control means internally and exteriorly of the furnace and exteriorly of the fire pot for electrically controlling operation of the laser light, whereby, upon operation of the laser light, that light is absorbed by the iron fire pot and the fire pot is oxidized and heated proportionally to the laser light wattage and duration of operation.

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4,389,561

SELF-POSITIONING WELDING OR CUTTING TORCH

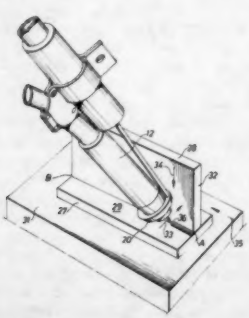
Klas B. Weman, and Hans E. A. Grohn, both of Laxa, Sweden, assignors to Esab Aktiebolag, Sweden

Filed Jun. 26, 1981, Ser. No. 277,989

Claims priority, application Sweden, Jul. 3, 1980, 8004926

Int. Cl.³ B23K 9/12

U.S. Cl. 219—124.34 3 Claims



1. A torch comprising a torch body having a longitudinal axis and a tip; a sensor mounted to said torch body for establishing the relative positions of said tip of said torch body and an object radially disposed relative to said longitudinal axis, said sensor comprising:

(a) an annular sensing body surrounding said tip of said torch body so that said torch body extends through said sensing body, said sensing body being radially displaceable relative to said tip upon contacting an object radially disposed relative to said tip of said torch at any point about the periphery of said tip;

(b) connecting means mounted to said sensing body to be angularly displaced with respect to said longitudinal axis in a direction and to an extent directly corresponding to the displacement of said sensing body;

(c) means for continuously detecting the angular displacement of said connecting means and generating a signal directly corresponding to said angular displacement; and

means for receiving said signal and continuously positioning said torch body in a direction and to an extent directly corresponding to said signal.

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4,389,562

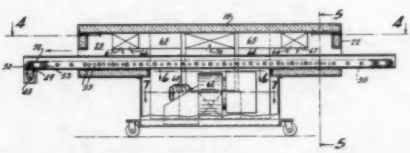
CONVEYOR OVEN

Roderick J. Chaudoir, Fox Point, Wis., assignor to Hatco Corporation, Milwaukee, Wis.

Filed Aug. 5, 1981, Ser. No. 290,150

Int. Cl.³ F27B 9/06; A21B 1/22

U.S. Cl. 219—388 17 Claims



1. A conveyorized oven comprising:

an insulated oven housing having at least one pair of spaced apart openings and an elongate heating tunnel located between each pair of openings;

conveyor means extending between each pair of said openings and adapted for moving a product to be heated from one of said openings to the other of said openings through said heating tunnel, said conveyor means comprising a bed of live rollers and said oven further comprising motor means coupled to said rollers for revolving said rollers whereby product may be moved through said heating tunnel;

heating element means located along the floor of said heating tunnel and adapted for heating product carried through said heating tunnel by said conveyor means, said heating element means comprising a plurality of elongate electrical resistance heating elements and wherein said resistance heating elements are disposed between said live rollers;

fan means;

duct means coupled to said fan means and including outlet means within said heating tunnel above said conveyor means; and,

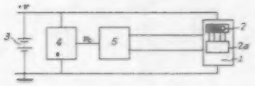
air heating means for heating air flowing through said duct means whereby product carried through said heating tunnel by said conveyor means is heated by heated air as well as by said heating element means.

4,389,563

## TAXIMETER SYSTEM FOR AVOIDING OPERATOR FRAUD IN THE COMPUTATION AND DISPLAY OF TRIP FARES

Claude F. Ricard, 10 Oliveraie G-Rte. de Nice, Aix-en Provence, France (13100)

Filed Oct. 6, 1980, Ser. No. 194,261
Claims priority, application France, Oct. 12, 1979, 79 25736
Int. Cl.³ G07B 13/10; G06F 15/20
U.S. Cl. 377—20 4 Claims



1. A process for avoiding fraud on the price of the fare indicated by an electronic taximeter of the type powered by a vehicle battery and having a computing unit for calculating the fare value, a luminous display means to display the fare, and a voltage comparator means which compares the supply voltage from the battery with a safety threshold voltage level and which suspends the calculation of the fare in the computing unit when the battery voltage drops below said safety threshold voltage level comprising the steps of:

comparing the supply voltage level of the taximeter with a safety threshold voltage level;

measuring the actual time period duration that the supply voltage level is below said safety threshold voltage level;

comparing the actual time period duration with a reference time period duration when the supply voltage level returns and exceeds said safety threshold voltage level; and

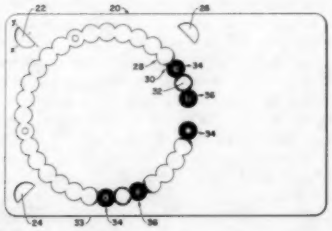
returning the value of the fare in the computing unit and the luminous display means to zero if the actual time period duration exceeds the reference time period duration, but resuming the calculation of the fare starting with the fare value reached when the operation of the computing unit was suspended if the actual time period duration does not exceed the reference time period duration.

4,389,564

## INDEXING MECHANISM FOR CARD ACCEPTOR

Henry J. Flair, Franklin Park, and Charles C. Rayburn, Mt. Prospect, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 262,096, May 11, 1981. This application Oct. 1, 1981, Ser. No. 307,469
Int. Cl.³ G06K 21/00
U.S. Cl. 235—489 5 Claims



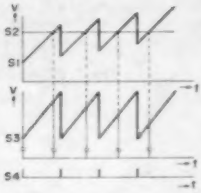
1. An acceptor mechanism for an encoded card and for performing a cycle of operation upon the acceptance thereof comprising punch means for punching at least one hole in said card upon the first operating cycle of said acceptor mechanism, punch carrier which carries said punch means and rotatable indexing means which may be selectively coupled to said punch carrier means and aligns said punch means with predetermined areas of said encoded card wherein said punch means may be indexed by said indexing means when said indexing means is coupled to said punch carrier means to a new area after a previous area has been punched.

4,389,565

## AUTOMATIC FOCUS CONTROLLING DEVICE

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Feb. 27, 1981, Ser. No. 238,747
Claims priority, application Japan, Feb. 29, 1980, 55/24772
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 8 Claims



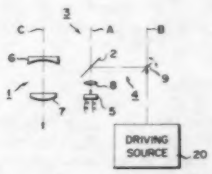
1. A device for automatically controlling focus adapted to an endoscope comprising an image transmitting fiber tube, an objective for focusing an image of an object to be observed or photographed on an entrance end face of the image transmitting fiber tube, an eyepiece for enlarging and viewing the image appearing at an exit end face of the image transmitting fiber tube, a light source for illuminating the object, a flexible light transmitting fiber tube for transmitting light from said light source to the object, and means for measuring the brightness of the object illuminated by said light source wherein the improvement comprises means for periodically changing the intensity of the light source, means for comparing the output of said brightness measuring means with a predetermined value and giving an output signal when the output of the measuring means has become equal to the predetermined value, means connected with said comparing means to receive said output signal for determining the distance of the object based on the intensity of the light source when the output signal is received thereby, and means for axially moving said objective to control focus according to the determined distance.

4,389,566

## AUTOMATIC FOCUSING APPARATUS FOR CAMERAS

Tadashi Kimura, Tokyo; Akihiko Hashimoto, Hachioji, and Atsushi Kidawara, Tachikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 41,336, May 22, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,875
Claims priority, application Japan, May 26, 1978, 53-62926; May 26, 1978, 53-62927
Int. Cl.³ G01J 1/20
U.S. Cl. 250—204 7 Claims




1. An automatic focus detection apparatus for a camera, comprising a first focusing optical system including a first half mirror transmitting light from a subject to a predetermined imaging position, a second focusing optical system including a second mirror leading light from the subject to said half mirror to be reflected on said half mirror to be led to said imaging position, at least one of said first and second mirrors being capable of moving to change the angle of reflection thereof, and a single focus detection element disposed in said imaging

position to detect focusing by means of the lights from both said mirrors.

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**4,389,567**

## SEMICONDUCTOR SWITCHING DEVICE FOR GUIDING AND AMPLIFYING RADIATION

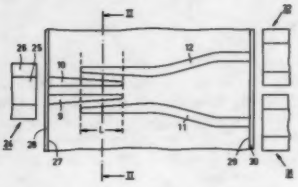
**Giok D. Khoe; Lambertus J. Meuleman, both of Eindhoven, Netherlands, and Tullio E. Rozzi, Wirrat, England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed May 30, 1980, Ser. No. 154,633**

**Claims priority, application Netherlands, Jun. 7, 1979, 7904470**

**Int. Cl.³ H01J *31/50***

**U.S. Cl. 250—213 R** **13 Claims**



1. A semiconductor switching device for guiding and amplifying electromagnetic radiation, having a semiconductor body with a substantially flat surface comprising a substrate region which is provided with a connection conductor, a plurality of strip-shaped radiation guiding members which comprise a layer structure having an active layer in which the radiation propagates and having a p-n junction in which each radiation guiding member is provided at its surface with at least one electrode for controlling a current in the forward direction through the p-n junction, at least one first radiation guiding member branching through a transition area into at least two further radiation guiding members which over the greater part of theri length are situated outside each other's amplification profile, and a layer structure on the substrate region which is common to all radiation guiding members and has an active layer of a homogeneous thickness and doping concentration, in which in the transition area between said first and said further radiation guiding members the electrodes of said guiding members have tapering juxtaposed ends, the active layer in the transition area, taken in the direction of width of the radiation guiding members, having a sufficiently small effective refractive index variation for the radiation and the distance between the two adjacent radiation guiding members being sufficiently small such that the guiding members are situated within each other's amplification profile, and the transverse dimensions of all radiation guiding members being sufficiently small such that guiding and amplification of only one single transversal mode of oscillation occurs.

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**4,389,568**

## METHOD FOR MONITORING IRRADIATED NUCLEAR FUEL USING CERENKOV RADIATION

**Edward J. Dowdy; Nicholas Nicholson, and John T. Caldwell, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 21, 1980, Ser. No. 151,870**

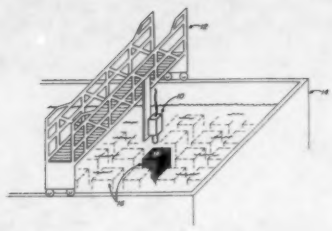
**Int. Cl.³ G01T *1/22***

**U.S. Cl. 250—362** **8 Claims**

1. A method of confirming irradiated nuclear fuel inventories located in a water-filled storage pond comprising the steps of:

locating a Cerenkov radiation receiving instrument above the surface of said pond and orienting said instrument such that its optical axis is aligned with the axis of a nuclear fuel assembly;

measuring the intensity of the Cerenkov radiation emitted from the water adjacent the fuel assembly; and



comparing the measured intensity with the expected intensity for nuclear fuel having a corresponding degree of exposure in a reactor core and time period after removal from the reactor core.

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**4,389,569**

## EMISSION COMPUTED TOMOGRAPH

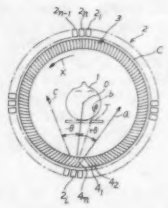
**Hiroyuki Hattori, Kyoto, and Kazuo Uemura, Akita, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan**

**Filed Dec. 10, 1980, Ser. No. 214,987**

**Claims priority, application Japan, Dec. 14, 1979, 54-163317**

**Int. Cl.³ G01T *1/20***

**U.S. Cl. 250—363 S** **16 Claims**



1. An emission computed tomograph comprising: means for supporting an object to be examined at a predetermined position so that the axis of said object coincides with a center, said object having taken therein a radionuclide that emits penetrating radiation such as gamma radiation; a plurality of radiation detectors; means for supporting said detectors side by side along a circle about said center so that the radiation incident planes of said detectors face said object so as to receive radiation from said object; collimating means disposed between said predetermined position and said detectors concentrically with said circle and provided with a plurality of slits arranged side by side circumferentially about said center for regulating said radiation emitted from said object so as to enter said detectors; means for supporting said collimating means rotatably about said center; and means for causing said collimating means to be rotated about said center so that those of the radiations emitted from said object which have a direction defined by each of said slits successively enter the corresponding one of said detectors thereby to tomographically scan said object.

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**4,389,570**

## WIDE RANGE RADIATION MONITORING APPARATUS

**Norman P. Goldstein, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 20,598, Mar. 14, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,490**

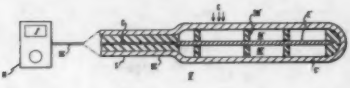
**Int. Cl.³ G01T *1/24***

**U.S. Cl. 250—370** **3 Claims**

1. A wide range radiation detector apparatus for generating

a current signal measurement of impinging radiation in a range from about $10^{-1}$ to about $10^{8}$ R/hr, said current signal including an ionization current component and self-powered current component, comprising:

a self-contained single detector means consisting of spaced apart collector means and an emitter element disposed therebetween, said collector means being constructed of a material having a different work function and different atomic number from the material of said emitter element,



a gas filling the volume defined by said spaced apart collector means, said volume of gas being such that the ionization current component of said current signal exceeds the self-powered current component at low radiation levels, the self-powered current component of said current signal exceeding said ionization current component at high radiation levels; and

current measuring means connected to said detector to manifest said current signal as an indication of impinging radiation.

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**4,389,571**

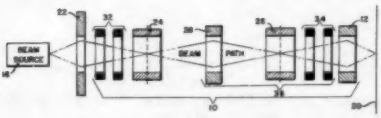
## MULTIPLE SEXTUPOLE SYSTEM FOR THE CORRECTION OF THIRD AND HIGHER ORDER ABERRATION

**Albert V. Crewe, Palos Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 1, 1981, Ser. No. 249,782**

**Int. Cl.³ G21K *1/08***

**U.S. Cl. 250—396 R** **6 Claims**




1. In an electron beam device having a source of electrons, the improvement in the device for correcting higher order aberration, comprising: first and second sextupoles, each for focusing a beam in an image plane, and each having a second-order astigmatism distribution, an intermediate lens positioned between said first and said second sextupoles for focusing the beam to a point in the center of said second, sextupole, a first lens for focusing the beam to a point in the center of said first, sextupole, and a second lens positioned in said image plane of said second, sextu-pole for focusing the beam to a point in a final image plane.

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**4,389,572**

## TWO MAGNET ASYMMETRIC DOUBLY ACHROMATIC BEAM DEFLECTION SYSTEM

**Ronald M. Hutcheon, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada**

**Filed Mar. 23, 1981, Ser. No. 246,872**

**Claims priority, application Canada, Jun. 4, 1980, 353640**

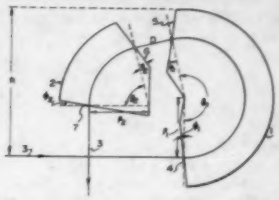
**Int. Cl.³ H01J *37/147***

**U.S. Cl. 250—396 R** **6 Claims**

1. A magnetic charged particle beam deflection system comprising:

first dipole magnet means for deflecting the beam in a plane along a path having a bending radius $\rho_1$ and a bending angle $\theta_1$ greater than 180° and less than 225°, said first magnet means having an effective exit edge at an angle $(90-\eta_1)$ with respect to the beam path at exit; and

second dipole magnet means for further deflecting the beam in the plane along a path having a bending radius $\rho_2$ and a bending angle $\theta_2$ of less than 90°, the second magnet



means having an effective entry edge at an angle $(90-\eta_2)$ with respect to the beam path, where $\eta_1 \approx -\eta_2$, and the first magnet means effective exit edge being a drift distance D from the second magnet means effective entry edge, wherein D is selected to match the first and second dipole magnet means dispersions in the drift region D.

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**4,389,573**

## PULSED ELECTRON BEAM DEVICE COMPRISING A CATHODE HAVING THROUGH HOLES

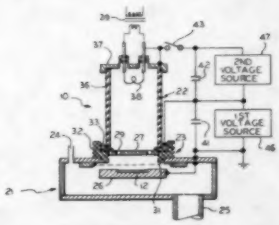
**Tadatsugu Itoh, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan**

**Filed Feb. 12, 1981, Ser. No. 233,858**

**Claims priority, application Japan, Feb. 14, 1980, 55-16850; Nov. 26, 1980, 55-165247**

**Int. Cl.³ H01J *3/00, 33/00***

**U.S. Cl. 250—492.2** **6 Claims**




1. A pulsed electron beam device for use in momentarily processing a sample by electron beams, said electron beam device comprising:

a chamber defining a hollow space filled with a predetermined gas;

a first electrode member placed in said space and having a principal surface for supporting said sample;

a second electrode member located in said space and having a first surface directed to said principal surface with a gap left therebetween and a second surface opposite to said first surface, said second electrode member having a predetermined number of through holes extending between said first and said second surfaces;

a third electrode member directed to said second surface in said space and being capable of emitting electrons;

first voltage providing means for providing a first voltage between said first and said second electrode members, with said first and said second electrode members kept at a first electric potential and a second electric potential negative relative to said first electric potential by said first voltage, respectively; and

second voltage providing means for momentarily providing a second voltage between said second and said third elec-

trode members, with said third electrode member momentarily given a third electric potential negative relative to said second electric potential by said second voltage, respectively, said second voltage thereby making a portion of the electrons emitted by said third electrode member pass through said through holes and momentarily produce said electron beams between said first and said second electrode members.

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**4,389,574**

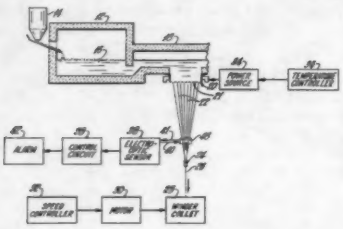
## METHOD AND APPARATUS FOR DETECTING A BREAK IN A PLURALITY OF GLASS FIBERS

**Frederick M. Shofner, Knoxville, Tenn.; Neil E. Greene, Granville, and Terry J. Hanna, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Jan. 2, 1981, Ser. No. 222,110**

**Int. Cl.³ C03B *37/025***

**U.S. Cl. 250—561** **14 Claims**




1. A method of detecting breakage of glass fibers comprising the steps of:

(a) illuminating a predetermined portion of said fibers in a fiber fan with electromagnetic radiation;

(b) sensing all of the electromagnetic radiation scattered backwards from the fibers which pass through a predetermined reflection zone;

(c) generating a first electrical signal, $V_f$, responsive to the amount of electromagnetic radiation sensed when the fibers are present;

(d) generating a second electrical signal, $V_b$, responsive to the amount of electromagnetic radiation sensed when no fibers are present;

(e) generating a third electrical signal, $V_{CAL}$, with a calibration device which interconnects the electromagnetic illuminating device of (a) above and the electromagnetic radiation sensing device of (b) above;

(f) inputting a fourth electrical signal, $V_{ref}$, by suitable exterior switching devices;

(g) using a microcomputer to generate a fifth electrical signal, $V_f$ from the above signals one through four proportional to the relationship:

$$V_f = (V_f - V_b)\frac{V_{ref}}{V_{CAL}}$$

(h) integrating said fifth electrical signal $V_f$ over time to produce a sixth electrical signal $V_{out}$;

(i) comparing the sixth electrical signal $V_{out}$ to a predetermined reference signal to determine when signal $V_{out}$ is less than the reference signal which is an indication of broken fibers; and

(j) activating an electrical circuit which alerts the operator when signal $V_{out}$ is less than the reference signal in (i) above to warn of broken fibers.

**4,389,575**

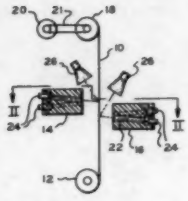
## FABRIC INSPECTION SYSTEM

**Frederick A. Cole, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.**

**Filed Jul. 3, 1980, Ser. No. 165,780**

**Int. Cl.³ G01N *21/88***

**U.S. Cl. 250—563** **5 Claims**




1. A fabric inspection system wherein relative movement occurs between a fabric and fabric inspection apparatus, comprising, in combination, motor means translating the fabric to be tested past an inspection station, electronic sensing means for detecting a defect in the fabric located at said inspection station and producing an electronic signal upon a defect being sensed, amplifier means amplifying said signal, a counter for recording the occurrence of a defect, counter control means connected to said amplifier means receiving said amplified signal and producing an electric pulse for operating said counter to record a defect wherein each pulse records a single defect upon said counter, said counter control means including pulse duration adjustment means whereby the duration of said pulse may be adjusted, said pulse, during its duration, rendering said counter control means inoperative to operate said counter upon receiving an amplified defect signal whereby said counter records only defect signals received intermediate pulse durations providing a defect count for spaced defects as determined by said pulse duration.

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**4,389,576**

## INSTALLATION TO MEASURE THE VISIBILITY LIMIT IN A FOG

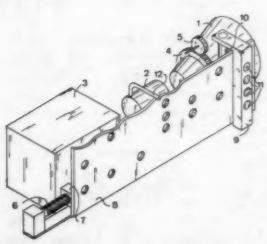
**Paul Rouet, Avenue Meurée, 4, B 6001 Marcinelle, Belgium**

**Filed Jul. 13, 1981, Ser. No. 282,786**

**Claims priority, application European Pat. Off., Jul. 17, 1980, 80200696**

**Int. Cl.³ G01M *15/06***

**U.S. Cl. 250—573** **7 Claims**




1. An apparatus for measuring the limit distance of visibility in a fog, comprising

a series of lights placed along a measuring distance;

an observation screen;

optical apparatus having a variable focus means for projecting an image of one or more of said lights on said observation screen;

control means for setting said variable focus means on a light

selected from said series of lights and simultaneously actuating said selected light;

at least one stationary assembly;

at least one movable assembly which moves in relation to said stationary assembly;

wherein one of said movable and stationary assemblies includes detectable information and the other of said movable and stationary assemblies includes at least one detector for detecting said information; and wherein said control means drives said movable assembly simultaneously with setting of said variable focus means whereby the position of said movable assembly indicates the positioning of said variable focus means.

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**4,389,577**

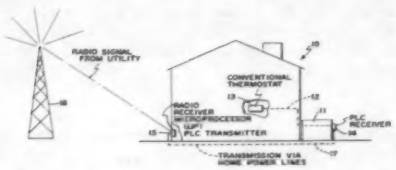
## APPARATUS FOR POWER LOAD-SHEDDING WITH AUXILIARY COMMANDABLE THERMOSTAT

**Paul A. Anderson, New Brighton; Jeffrey M. Hammer, St. Louis Park, and J. Ward MacArthur, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Apr. 14, 1982, Ser. No. 368,487**

**Int. Cl.³ H02J** *13/00*

**U.S. Cl. 307—39** **10 Claims**




1. An apparatus for controlling the operation of a thermostatically controlled space-conditioning means comprising:

auxiliary thermostat means disposed in a conditioned space for controlling the ON-OFF cycling function of a space conditioning means during a load-shedding interval;

space conditioning control means in communication with said auxiliary thermostat means for connecting and disconnecting power to said space conditioning means in response to communications from said auxiliary thermostat means;

disconnect means connected to said space conditioning control means for disconnecting the thermostat utilized during normal operation of the space conditioning means for the interval of control by said auxiliary thermostat means; and

communication means including transmitter means associated with said auxiliary thermostat means for sending control signals to said space conditioning control means and receiving means associated with said space conditioning control means for receiving said control signals.

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**4,389,578**

## CONTROLLED GATE CIRCUIT

**Delmer W. Wagner, 326 Pine Grove Rd., Rogue River, Oreg. 97537**

**Division of Ser. No. 61,087, Jul. 26, 1979, abandoned, which is a division of Ser. No. 795,945, May 18, 1977, which is a division of Ser. No. 702,874, Jul. 6, 1976, Pat. No. 4,039,939. This application Apr. 2, 1981, Ser. No. 255,393**

**Int. Cl.³ H03K** *17/74, 5/00*

**U.S. Cl. 307—256** **8 Claims**

1. A controllable gate circuit comprising:

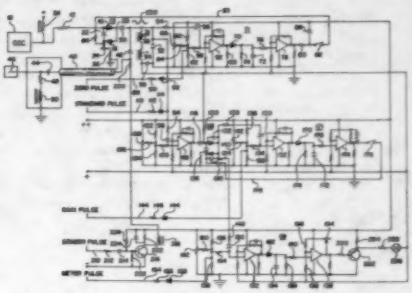
an input terminal and an output terminal,

a first diode poled in the first direction between said input terminal and output terminal,

a series connection of a capacitor and an oppositely poled diode disposed in that order between said input terminal and said output terminal,

integrating circuit means for generating a gating signal having a relatively steady value,

means for coupling said gating signal to the juncture between said capacitor and said oppositely poled diode to control the analog clipping levels of said diodes,



and means for controllably varying said value of said gating signal from said integrating circuit means over a relatively continuous range to determine said clipping levels of said diodes and therefore to determine the degree of conduction between said input terminal and said output terminal.

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**4,389,579**

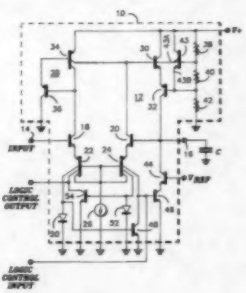
## SAMPLE AND HOLD CIRCUIT

**Marc T. Stein, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 11,733, Feb. 13, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 238,729**

**Int. Cl.³ H03K** *5/03;* **G01R** *19/04;* **G11C** *27/02*

**U.S. Cl. 307—353** **12 Claims**




1. Sample and hold circuit comprising:

charge storage means;

unity gain amplifier means having first, second inputs and an output, said output being coupled both to second input and to said charge storage means, said unit gain amplifier means being responsive to an input signal being applied to said first input for producing an output signal at said output having a magnitude substantially equal to the magnitude of said input signal such that said charge storage means is charged to the magnitude of said output signal;

discharging circuit means coupled with said unity gain amplifier means to said charge storage means for discharging said charge storage means when said magnitude of the signal developed across said charge storage means is greater than said magnitude of said input signal such that said signal developed across said charge storage means

becomes substantially equal to the magnitude of said input signal; and

said unity gain amplifier means including

a. power supply conductor means adapted to be connected to a source of operating potential;

b. a differential amplifier having first and second inputs and first and second outputs, the input signal being applied to said first input, said second input being coupled to said second input of said unity gain amplifier means;

c. current mirror circuit means coupled between said first and second outputs of said differential amplifier and said power supply conductor means for providing substantially equal currents thereto in response to said input signal exceeding the magnitude of said signal appearing across said charge storage means; and

d. cascoded circuit means coupled between said second output and said second input of said differential amplifier.

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**4,389,580**

## FLEXIBLE TAPE ELECTROACOUSTIC TRANSDUCER USING AN ELECTRET

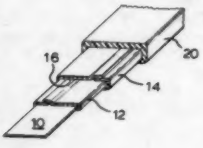
**Andre P. J. Bendyshe Walton, Guildford; Francis H. Townsend, Alton, and John N. Ribet, East Twickenham, all of England, assignors to C. Tape Developments Limited, Four Marks, England**

**Filed Jan. 22, 1981, Ser. No. 227,476**

**Claims priority, application United Kingdom, Mar. 3, 1980, 8007167**

**Int. Cl.³ H04R** *23/00*

**U.S. Cl. 307—400** **6 Claims**




1. A transducer in the form of a flexible tape comformable to a surface to detect acoustic waves propagating along the surface, the transducer comprising a first flat metal foil, an outer metal foil which is wrapped around the first metal foil so as to envelop said first metal foil and which is separated therefrom by a dielectric material acting as an electret and means for applying a d.c. voltage across the electret in a sense to enhance the polarisation within the electret, the outer metal foil being maintained at earth potential.

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**4,389,581**

## PULSE DUTY CONTROL SYSTEM

**Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan**

**Filed Aug. 29, 1980, Ser. No. 182,846**

**Int. Cl.³ H02M** *5/10*

**U.S. Cl. 307—419** **8 Claims**

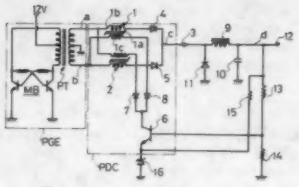
1. A pulse duty control system, comprising:

pulse generator means for producing a first and a second set of pulses, said first and second set of pulses being phase displaced by 180° from each other;

a current controlling element having a conduction level controlled in accordance with a control voltage derived from a signal appearing at an output terminal of said system;

a first pulse duty controlling element including a first core made of an amorphous magnetically soft material having a first electrical coil and a second electrical coil disposed thereon, said first coil having a first terminal coupled to receive said first set of pulses and having a second terminal coupled to said output terminal of said system through a first diode, said second coil having a first terminal coupled to receive said second set of pulses and having a second terminal coupled to said current controlling element; and

a second pulse duty controlling element including a second core made of an amorphous magnetically soft material




having a third electrical coil and a fourth electrical coil disposed thereon, said third coil having a first terminal coupled to receive said second set of pulses and having a second terminal coupled to said output terminal of said system through a second diode, said fourth coil having a first terminal coupled to receive said first set of pulses and having a second terminal coupled to said current controlling element.

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**4,389,582**

## MOS INTEGRATED LOGIC CIRCUIT DEVICE WITH IMPROVED SWITCHING SPEED CHARACTERISTICS

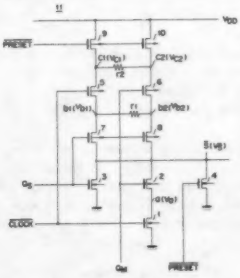
**Yasoji Suzuki, and Kenji Matsuo, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jan. 29, 1980, Ser. No. 116,556**

**Claims priority, application Japan, Feb. 9, 1979, 54-13412; Feb. 9, 1979, 54-13413; Feb. 9, 1979, 54-13892**

**Int. Cl.³ H03K** *19/017, 19/096, 19/20*

**U.S. Cl. 307—452** **3 Claims**




1. A semiconductor integrated logic circuit device for delivering a signal to an output terminal in response to a plurality of input signals, including clock and control signals, and being connected to first and second power sources, said device comprising:

a first logic circuit including a plurality of first series circuits, each first series circuit being constructed by connecting in a series a plurality of MOS transistors of a first conductivity type having drain, gate and source electrodes, with a predetermined one of said source electrodes of each first series circuit being connected to the first power source and a predetermined one of said drain electrodes of each first series circuit being connected to the output terminal to dispose said first series circuits in parallel between the first power source and the output terminal, said predeter-

mined ones of said drain and said source electrodes collectively defining a set of electrodes;

a second logic circuit including a plurality of second series circuits connected in parallel between the second power source and the output terminal, each second series circuit being constructed by connecting at least one MOS type transistor of a second conductivity type having drain, gate and source electrodes, in series between the second power source and the output terminals;

each of said gate electrodes of said first and second logic circuits receiving one of the input signals wherein at least one of the transistors of said first logic circuit receives the clock signal and wherein the rest of the transistors of said first logic circuit not receiving said clock signal receive the control signals, with a predetermined number of transistors of said first logic circuit together defining a first set of transistors with each transistor of said first set of transistors being selected from a different one of said first series circuits and with the gate electrodes of said first set of transistors all connected in common to receive the same input signal; and

first electrical resistor means connecting at least one pair of like electrodes other than said gate electrodes of said first set of transistors, wherein said like electrodes are selected from other than said set of electrodes.

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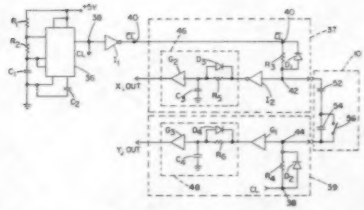
**4,389,583**

## CAPACITANCE SWITCH DETECTION CIRCUITRY

**James P. Walber, Cedar Grove, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.**

**Filed Jun. 8, 1981, Ser. No. 271,398**
**Int. Cl.³ H03K** *9/06, 17/18*
**U.S. Cl. 307—522** **7 Claims**



1. Detection circuitry for a capacitance switch having one capacitance value in an activated condition and a different capacitance value in a deactivated condition, the circuitry comprising

a source suppling a first clock node and a second clock node with two-state electrical pulses 180° out of phase,

first and second switch connection nodes for connecting a switching element in said capacitance switch to said circuitry,

a buffer having an input connected to said first switch connection node, and providing an output signal depending upon the condition at said buffer input relative to a threshold value,

means connected between said clock nodes and said switch connection nodes for responding to the capacitance associated with one condition of said switch by maintaining said buffer input at a condition relative to said threshold value of said buffer and for responding to a capacitance associated with another condition of said switch by permitting the condition at said buffer input to vary sufficiently to cause the output of said buffer to vary with said two-state pulses, and

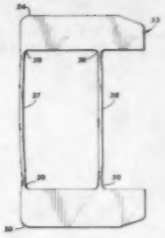
a frequency detector connected to said buffer, to determine which condition said capacitance switch is in.

**4,389,584**

## DYNAMOELECTRIC MACHINE PHASE INSULATORS AND APPARATUS FOR MAKING THE SAME

**Richard D. Burns, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 8,603, Feb. 1, 1979. This application Aug. 29, 1980, Ser. No. 182,631**
**Int. Cl.³ H02K** *1/04*
**U.S. Cl. 310—43** **4 Claims**



1. In a stator assembly for a dynamoelectric machine comprising a magnetic core having axially extending and circumferentially spaced slots, a centrally disposed axially extending bore, first and second winding phases arranged in selected ones of such slots; wherein circumferentially extending end turn portions of the winding phases are insulated from one another by phase insulation having circumferentially extending portions positioned between end turn portions of the first and second winding phases, the improvement wherein: the phase insulation includes first and second circumferentially extending insulation portions interconnected by elongate connectors that extend between and interconnect the circumferentially extending insulation portions and wherein the legs are made from insulating material that is in a prestressed and inelastically pre-elongated condition.

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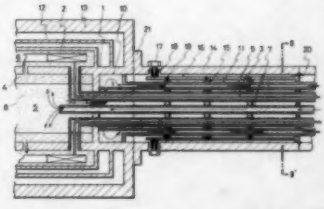
**4,389,585**

## SUPERCONDUCTIVE ROTOR

**Kiyoshi Yamaguchi, Hitachi; Naoki Maki, Tokai, and Toshio Tamura, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 1, 1981, Ser. No. 279,552**
**Claims priority, application Japan, Jul. 1, 1980, 55-88479**
**Int. Cl.³ H02K** *9/00*
**U.S. Cl. 310—52** **9 Claims**



1. A superconductive rotor comprising a torque tube, a superconductive field coil supported by said torque tube, a hollow shaft connected to said torque tube, at least one power lead passing through said hollow shaft for supplying exciting electric current to said superconductive field coil, refrigerant supply and discharge pipes extending through said hollow shaft for supplying and discharging a refrigerant to cool said superconductive field coil, a plurality of spacer means disposed in the hollow shaft for holding said at least one power lead and said pipes, supporting sleeve means axially extending through

said hollow shaft for securing thereto said spacer means, and adjusting means for supporting one axial end portion of said supporting sleeve means and for enabling a centering of said supporting sleeve means with respect to said hollow shaft from an outer side of said hollow shaft.

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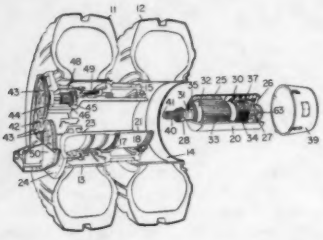
**4,389,586**

## ELECTRIC WHEEL WITH REMOVABLE MOTOR

**David L. Foster, North East; John F. Haupt, and Malcolm W. Waite, both of Erie, all of Pa., assignors to General Electric Company, Erie, Pa.**

**Filed Feb. 22, 1982, Ser. No. 350,832**
**Int. Cl.³ H02K *7/00*; B60K *7/00***
**U.S. Cl. 310—67 R** **11 Claims**



**1.** For propelling a traction vehicle having a frame and a rotatable wheel, a dynamoelectric machine including:

a. a stator yoke comprising (i) an outer hollow cylindrical member of relatively large diameter adapted to be secured to said frame and (ii) an inner hollow cylindrical member of smaller diameter nested generally concentrically inside said outer member, (iii) both of said members being made of magnetizable material, (iv) said inner member being removably mounted to the outboard end of said outer member and, when so mounted, having most of its convex outside surface normally spaced by a small gap from the cooperating concave inside surface of said outer member;

b. means for rotatably supporting said wheel on the outside of said outer member;

c. a rotor supported concentrically within said inner member so as to be rotatable with respect thereto, said rotor comprising a cylindrical core of magnetizable material disposed in spaced relation to said inner member;

d. means including a speed-reducing gear train for mechanically coupling said rotor to said wheel; and

e. means for producing a field of magnetic flux in said stator yoke and said core, the path of the flux in said yoke including parallel first and second branches in said inner and outer members, respectively, with said second branch carrying a substantial portion of said flux;

f. said first branch of said flux path having a cross-sectional area such that the magnetic flux density in said first branch would be appreciably greater than an intrinsic saturation limit if said first branch alone were carrying all of the flux that is produced when said machine is operating at its maximum continuously rated load.

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**4,389,587**

## UNITARY SLEEVING INSULATION

**Herbert R. Levine, Dover, and L. Gerard Landry, Somersworth, both of N.H., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Nov. 23, 1981, Ser. No. 324,307**
**Int. Cl.³ H02K *3/04***
**U.S. Cl. 310—208** **5 Claims**

**3.** An electrical coil lead insulated with an electrically insulating sleeving material, the improvement comprising as the electrically insulating sleeving a material having an electrically insulating inner layer overcoated with an electrically insulating polymer, and a layer of fibrous insulation overbraided on the insulating polymer, the entire sleeving impregnated with a polymer binder so as to produce a unitary insulating sleeving with high dielectric strength, flexibility, and resistance to slippage.

**4.** The insulated coil lead of claim **3** wherein the inner layer is woven fiberglass, the insulating polymer is acrylic polymer, and the fibrous insulation is fiberglass.

**5.** The insulated coil lead of claim **3** additionally coated with VPI resin or dip varnish.

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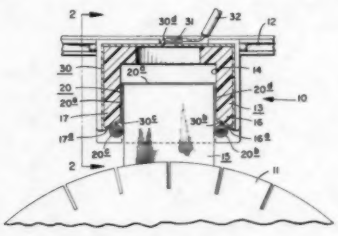
**4,389,588**

## CURRENT CARRYING CONSTANT FORCE BRUSH HOLDER ASSEMBLY

**Alexander Rankin, c/o Vulcan Spring & Mfg. Co., 1458 County Line Rd., Huntingdon Valley, Pa. 19006**

**Filed Mar. 24, 1982, Ser. No. 361,336**
**Int. Cl.³ H02K *13/00***
**U.S. Cl. 310—242** **3 Claims**



**1.** For use in making electrical contact between relatively movable electrical conductors, a brush holder assembly comprising:

a brush holder having a brush-receiving cavity and a pair of shoulders disposed on opposite sides of said cavity and adapted to confront a movable conductor,

a brush slidably received in said cavity, said brush having an outer end and an inner end adapted to engage said movable conductor,

a twin coil spring of electrically-conductive metal mounted in said holder, said twin coil spring having a pair of coils disposed on opposite sides of said brush and an integral saddle engaging the outer end of said brush, said twin coil spring between said coils and said saddle portion adapted to engage opposite sides of said brush and provide electrical communication between said coils and brush, and

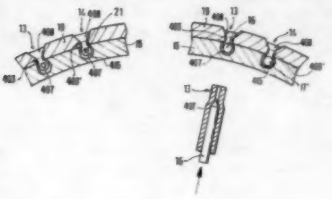
means providing an electrical contact between at least one of said shoulders and its respective coil of said twin coil spring,

whereby a relatively short current path is provided between the spring coil and the brush.

## 4,389,589
## DYNAMO ELECTRIC MACHINE-INTERNAL COMBUSTION ENGINE COMBINATION STRUCTURE

**Siegfried E. Schustek, Immenstaad, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 3, 1981, Ser. No. 289,194**
**Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037793**
**Int. Cl.³ H02K *1/28***
**U.S. Cl. 310—258** **5 Claims**



1. Dynamo electric machine construction in combination with an internal combustion engine structure including

a flywheel (**15**) and a housing (**2**) surrounding, at least in part, said flywheel

said dynamo electric machine construction having a stator (**1**) secured to the housing (**2**);

segmental permanent magnet rotor element (**19**);

and attachment means for attaching the segmental permanent magnet elements of the rotor to the flywheel under tension, to securely attach said segmental elements to the flywheel,

said attachment means comprising

a shaft, or web element (**403, 403'**) and two head elements (**407, 408**) formed on said shaft or web element;

one head element (**408**) bearing against the permanent magnet segments, and other head element (**407**) bearing against the flywheel,

wherein the flywheel is formed with a plurality of axially extending cylindrical bores (**415**) adjacent the rim thereof and in the region of attachment of the permanent magnet segments;

the head elements (**407**) engaging the flywheel are formed with enlargements fitting into the axial bore of the flywheel, said enlarged head elements being formed with an axially extending bores (**21**) therein, the head elements being deformed by expansion from a smaller size, after insertion into the axially extending bores (**415**) of the flywheel to place the shaft or web element connecting the head elements under tension and thereby securely attach the permanent magnet segments against the flywheel, said enlarged, deformed head element essentially filling the axially extending bores in the flywheel.

## 4,389,590
## SYSTEM FOR RECORDING WAVEFORMS USING SPATIAL DISPERSION

**Robert R. Whitlock, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 26, 1981, Ser. No. 296,402**
**Int. Cl.³ H01L *41/08***
**U.S. Cl. 310—313 R** **12 Claims**

1. A waveform recorder comprising:

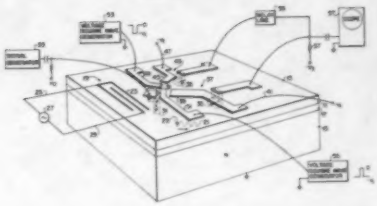
a semiconductor body;

a planar piezoelectric body having a main surface overlying and in proximity to the semiconductor body;

first wave propagation means for propagating acoustic wave signals on the main surface of the piezoelectric body to create traveling potential wells in the underlying semiconductor body;

charge injection means for injecting into the potential wells traveling past at least one first location in the semiconductor body a quantity of minority charge carriers whose magnitude tracks with time the waveform of a signal to be recorded;

charge collection means for collecting the injected charge carriers at a plurality of spatially separated second locations in the semiconductor body;



first semiconductor depletion means for depleting the semiconductor body in one region between the first and second locations to provide a first channel for the transport of the minority charge carriers by the traveling potential wells; and

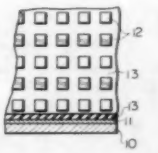
charge dispersion means for causing charge carriers injected into the potential wells at each of a plurality of instants of time to be transported to a respective one of the second locations,

whereby the pattern of charge collected at the plurality of spatially separated second locations represents the waveform of the signal to be recorded.

## 4,389,591
## IMAGE STORAGE TARGET AND IMAGE PICK-UP AND STORAGE TUBE

**Yoshihiro Uno, Kawasaki, Japan, assignor to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Continuation of Ser. No. 876,061, Feb. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 623,013, Oct. 16, 1975, abandoned. This application Jan. 11, 1980, Ser. No. 111,308**
**Int. Cl.³ H01J *31/58***
**U.S. Cl. 313—391** **4 Claims**




1. A target structure for an electron storage tube operable on a potential lower than the potential which produces electron-bombardment-induced conductivity to store an electron image in response to an intensity-modulated electron beam and repeatedly read out the stored electron image in response to a periodic impingement of an unmodulated electron beam, comprising an electrically conductive layer, a resistive layer disposed on said conductive layer, and a plurality of insulative regions having a resistivity greater than the 14th power of 10 ohm cm. for storage of said electron image and disposed on said resistive layer, said resistive layer having a resistivity in a range between the 5th power of 10 ohm-cm. and the 12th power of 10 ohm cm. which remains unchanged in the presence of said impingement of the electron beam accelerated by

the regions in the direction of the electron beam being in a range between 1 micrometer and 100 micrometers.

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**4,389,592**

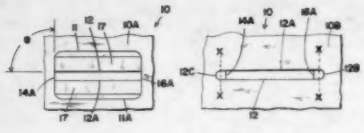
## COLOR PICTURE TUBE AND APERTURE MASK THEREFOR

**Roland Thoms, Mullheim, Fed. Rep. of Germany, assignor to Buckbee-Mears Company, St. Paul, Minn.**

**Continuation of Ser. No. 148,682, May 12, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,149**

**Int. Cl.³ H01J** *29/07*

**U.S. Cl. 313—403** **6 Claims**



**1.** A color television tube comprising:

an enclosure having a viewing surface on one end with a plurality of phosphor regions for generating light of three primary colors on the viewing surface of said enclosure, at least one electron gun to excite said phosphor regions;

an aperture mask located proximate said viewing surface, said aperture mask having a plurality of line of sight openings, said aperture mask having a first side and a second side, said aperture mask first side having an edge which defines an outline of a portion of a line of sight opening in said first side of said aperture mask;

said aperture mask second side surface having an edge which defines an outline of a portion of a line of sight opening in said second side of said aperture mask so that a line of sight opening of said plurality of line of sight openings comprises an opening for electrons to pass through which is partially bounded by said edge on said aperture mask first side and partially bounded by said edge on said aperture mask second side, said aperture mask positioned between said electron gun and said phosphor regions with said aperture mask first side facing said viewing surface and said aperture mask second side facing said electron gun to thereby permit said second side of said mask to act as a shield to prevent electrons from impinging on the improper phosphor region.

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**4,389,593**

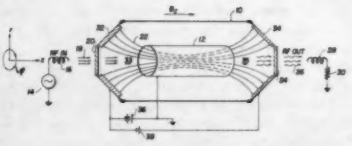
## ACTIVE DIELECTRIC WAVEGUIDE AMPLIFIER OR OSCILLATOR USING A HIGH DENSITY CHARGED PARTICLE BEAM

**Charles M. DeSantis, Neptune, and Louis J. Jasper, Jr., Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 17, 1981, Ser. No. 255,121**

**Int. Cl.³ H01J** *25/00*

**U.S. Cl. 315—4** **16 Claims**



**1.** An RF slow wave particle beam amplifier device comprising:

an evacuated waveguide structure included within an envelope, said waveguide structure having an internal cross sectional dimension which exceeds five times the wavelength of a predetermined RF frequency of a wave propagated therethrough, including a coaxial RF input window and a coaxial RF output window for providing entry and exit of a wave to and from said envelope, the waveguide structure comprising a hollow cylindrical, metal structure with a smooth inner wall;

thermionic cathode means for generating and projecting a relatively high density electron particle beam providing an effective dielectric constant through said waveguide structure to provide an active, dielectric medium;

means for providing an axial magnetic field through said waveguide structure for focusing, confining and causing rotation of the particles of said beam in said waveguide structure at a cyclotron frequency $w_c$ which is expressed by the equation:

$$w_c = hB_O$$

where h is the charge to mass ratio of said beam and $B_O$ is the magnetic flux density, including means for adjusting $B_O$ and h for shaping the beam geometry;

means for generating and launching an elliptically polarized RF wave of predetermined millimeter waveband frequency onto said high density beam whereupon said active dielectric medium operates as a waveguide to guide said RF wave and transfer energy to said wave as the RF wave propagates on said beam when the drift velocity of said beam is substantially the same as or greater than the phase velocity of said RF wave; wherein the effective relative dielectric constant $e_r$ of said beam is expressed in the form of a diagonal matrix as:

$$e_r = \begin{pmatrix} 1 - \frac{w_p^2}{ww_D}\left(\frac{W_D}{W_D \pm W_c}\right) & o & o \\ o & 1 - \frac{w_p^2}{ww_D}\left(\frac{W_D}{W_D \pm W_c}\right) & o \\ o & o & 1 - \frac{w_p^2}{ww_D} \end{pmatrix}$$

where $w_p$ is the beam frequency, $w_c$ is the cyclotron frequency, w is the frequency of the RF wave, and $W_D$ is the Doppler shifted frequency of the RF wave according to the expression:

$$W_D = W\left(1 - \frac{u_o}{v}\right)$$

where $u_o$ is the drift velocity of the beam and v is the phase velocity of the wave in the beam;

means for controlling the drift velocity of said particle beam in said waveguide structure by means of d.c. fed electrode;

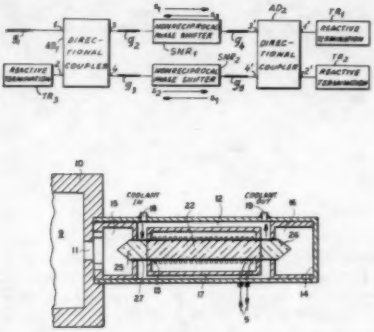
collector means for collecting said beam downstream at opposite end from said generating and projecting means; and

means for receiving said RF wave emerging from said beam following propagation thereon.

## 4,389,594
## DEVICE FOR ELECTRONICALLY TUNING A POWER MAGNETRON

Giuseppe Conciauro, and Paolo Arcioni, both of Pavia, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Aug. 6, 1980, Ser. No. 175,923
Claims priority, application Italy, Aug. 7, 1979, 24966 A/79
Int. Cl.³ H01J 25/50
U.S. Cl. 315—39.55 8 Claims







1. A device for electronically tuning a power magnetron provided with an anode cavity, comprising:

a first waveguide connected at one end to said anode cavity through a coupling aperture and provided with a first reactive termination at the opposite end;

a second waveguide communicating via a first directional coupler with a section of said first waveguide adjacent said one end thereof and via a second directional coupler with a section of said second waveguide adjacent said opposite end thereof, said second waveguide being provided with a second reactive termination adjacent said second directional coupler and with a third reactive termination adjacent said first directional coupler;

a first ferrite insert disposed in said first waveguide between said first and second directional couplers;

a second ferrite insert disposed in said second waveguide between said first and second directional couplers; and

control means for subjecting each of said ferrite inserts to a variable magnetization current, thereby differentially shifting the phases of two microwave components traversing said waveguides through said directional couplers in mutually opposite directions.

6. A device for electronically tuning a power magnetron provided with an anode cavity, comprising:

an elongate waveguide of identical configuration in two mutually orthogonal axial planes, said waveguide being connected at one end to said anode cavity through a coupling slot extending in one of said planes and being provided with a reactive termination at the opposite end, said waveguide being longitudinally divided into a first transition portion adjoining said one end, a main portion adjoining said first transition portion and a second transition portion extending from said main portion to said opposite end;

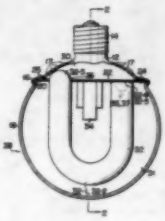
a ferrite insert disposed in said main portion; and

control means for subjecting said ferrite insert to a variable magnetization current for differentially shifting the phases of two counterrotating components of a linearly polarized microwave transmitted to said waveguide from said anode cavity through said coupling slot and reflected back toward said coupling slot by said reactive termination, said first and second transition portions being devoid of phase-shifting means.

## 4,389,595
## FLUORESCENT LAMP

Taketo Kamei, and Motokazu Hayashi, both of Yokosuka, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1980, Ser. No. 190,252
Claims priority, application Japan, Sep. 29, 1979, 54-135196[U]; Sep. 29, 1979, 54-135197[U]; Sep. 29, 1979, 54-135208[U]
Int. Cl.³ H01J 7/44, 17/34, 19/78, 29/96; H01K 1/62
U.S. Cl. 315—57 22 Claims



1. A fluorescent lamp comprising:

an envelope including a hollow globe member made of at least a translucent material and defining an open end, and a base member including a screw base, said base member attached to and covering said open end of said globe member, said globe and said base members together defining an inner space;

a fluorescent tube comprising a light emitting tube section which is encased in said envelope and which is formed in a folded U-shape having two ends, a U-shaped end portion and a pair of leg portions parallel to said U-shaped end portion and respectively extending from said two ends, a pair of electrodes respectively formed at said two ends, an exhaust tube protruding from at least one of said two ends, and a pair of lead wires connected to said electrodes and respectively extending from said two ends;

plate means disposed in said envelope for dividing said inner space of said envelope into a globe side space and a base side space for supporting said fluorescent tube at least at said two ends thereof so that most of said fluorescent tube is enclosed within said globe side space, said plate means including means permitting a portion of said fluorescent tube to extend into said base side space through said plate means, said portion thereby forming a cooling area on said fluorescent tube;

reactance ballast means provided on said plate means enclosed in said globe side space and connected to said lead wires for regulating current flowing through said fluorescent tube; and

cooling means defining openings in said envelope for expelling heat generated by said fluorescent tube and said reactance ballast means to the exterior of said envelope.

## 4,389,596
## PHOTOMETRY POWER SUPPLY FOR AUTOMATIC ELECTRONIC FLASH

Isao Kondo, and Hiroaki Nakamura, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Nov. 9, 1981, Ser. No. 319,424
Claims priority, application Japan, Dec. 5, 1980, 55-172451
Int. Cl.³ H05B 41/36
U.S. Cl. 315—151 5 Claims

1. Apparatus, comprising:

a main capacitor connected to a power supply;

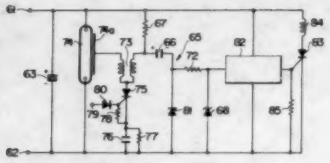
a first discharge circuit for discharging a trigger capacitor in response to the actuation of a trigger switch;

a flash discharge tube connected to said main capacitor in such a manner that said main capacitor discharges through

said flash tube, causing said flash tube to emit light, in response to the discharge of said trigger capacitor;

a second discharge circuit for discharging part of the charge on said main capacitor once said first discharge circuit has stopped discharging said trigger capacitor, said second discharge circuit including said trigger capacitor;

an impedance element forming part of said second discharge



circuit for developing a voltage thereacross as said part of the charge of said main capacitor is discharged through said second discharge circuit;

a photometric circuit powered by said voltage developed across said impedance element; and

means for terminating the emission of flash light from said flash discharge tube whenever a proper photometric value, as measured by said photometric circuit, is reached.

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**4,389,597**

**CIRCUIT FOR A FLASHER UNIT**

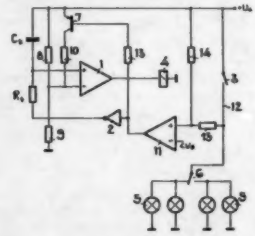
**Gerhard Krumrein, Neuenstadt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 16, 1981, Ser. No. 244,257**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012263**

**Int. Cl.³ H05B** *39/04, 41/14*

**U.S. Cl. 315—200 A** **8 Claims**



1. In a circuit for a flasher unit comprising an astable multivibrator which controls a flasher relay and an inverter connected in front of an RC-element of the multivibrator, with said inverter being controlled by a signal which depends on the switching condition of the flasher relay; the improvement wherein the feedback for said multivibrator passes from the contact path of said flasher relay to said RC-element via said inverter and a comparator for establishing and evaluating the switching condition of the relay contact.

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**4,389,598**

**DISCO LIGHT ASSEMBLY**

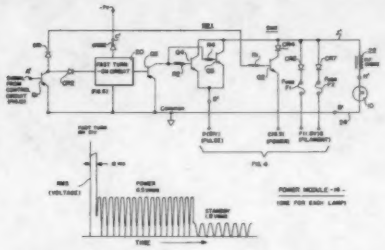
**Robert M. Smith, 1443 Centinela Ave., Santa Monica, Calif. 90404**

**Filed Feb. 10, 1981, Ser. No. 233,173**

**Int. Cl.³ H05B** *39/02*

**U.S. Cl. 315—291** **18 Claims**

1. A control system for selectively energizing a plurality of electric lamps including: power supply means; a plurality of control modules connected to said power supply means for respectively energizing respective ones of said lamps; and control circuitry connected to said control modules for causing the control modules selectively to activate the lamps, each of said control modules including: first circuit means for supplying a continuous electric current to the corresponding lamp with an amplitude sufficient to maintain the filament of the lamp in a warm state but insufficient to illuminate the lamp, second circuit means including switching means responsive to



control pulses from said control circuitry for selectively introducing a power current to the corresponding lamp of sufficient intensity to illuminate the lamp, and third circuit means including switching means responsive to said control pulses from said control circuitry for introducing current pulses to the corresponding lamp filament of a high amplitude as compared with the amplitude of said power current, each of said current pulses being introduced to the lamp filament for a limited time interval.

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**4,389,599**

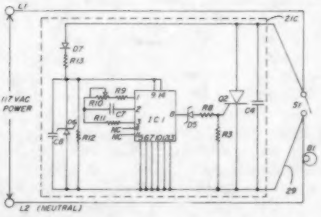
**LIGHT SWITCH DELAY CIRCUIT**

**Tony Jabor, 9001 Galena, El Paso, Tex. 79904**

**Continuation-in-part of Ser. No. 160,095, Jun. 16, 1980, Pat. No. 4,339,696. This application Jul. 6, 1982, Ser. No. 395,654**

**Int. Cl.³ H05B** *39/00*

**U.S. Cl. 315—360** **4 Claims**



1. A delay circuit adapted to be connected across a light switch for maintaining an electric light bulb on for a given time after the switch has been opened, and wherein the switch has two terminals connected to two leads respectively to which A.C. voltage is applied, with the bulb being connected to one of said leads, said delay circuit comprising:

a first lead adapted to be connected to one terminal of the switch,

a second lead adapted to be connected to the other terminal of the switch,

a switching means connected to said first and second leads respectively for turning the bulb on when said switching means is on and the switch is open,

control circuitry comprising an oscillator means and a counting means,

said counting means counting pulses from said oscillator means when said control circuitry becomes operative,

means responsive to the opening of the switch for causing said control circuitry to become operative,

when said control circuitry becomes operative, said control circuitry applies an output to said switching means for enabling said switching means to turn on,

said control circuitry terminating the output after a predetermined count is reached.

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**4,389,600**

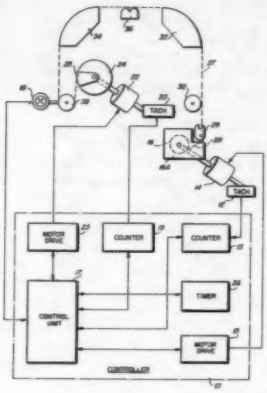
## TAPE MEDIA INTERLAYER TENSION CHECK

**Charles A. Milligan, Cochise, and Daniel J. Winarski, Pima, both of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 26, 1981, Ser. No. 315,113**

**Int. Cl.³ G11B *15/43, 15/18***

**U.S. Cl. 318—6** **10 Claims**




1. Apparatus for checking for interlayer slip of a coiled web of material comprising:

a supply reel for holding a coil of a plurality of layers of the web of material;

restraining means for holding the free end of the web of material;

first drive means for reversibly rotating said supply reel in a direction to tighten the coil of the web of material;

sensing means connected to said first drive means for generating signals representing the rotational displacement and direction of said first drive means;

a take-up reel;

second drive means connected to said take-up reel for reversibly rotating said take-up reel; and

control means connected to said first and second drive means and to said sensing means for activating said first drive means to rotate said supply reel in said direction to tighten the web of material against said restraining means and having means responsive to the generated signals from said sensing means indicating a predetermined rotational displacement to control said first and second drive means to rereel the web of material to overcome interlayer slip.

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**4,389,601**

## POWER SUPPLY HAVING AUTOMATIC FREQUENCY CONTROL FOR ULTRASONIC BONDING

**Robert A. Sullivan, West Chester, Pa., assignor to Sonobond Corporation, West Chester, Pa.**

**Filed Sep. 8, 1980, Ser. No. 184,840**

**Int. Cl.³ H01L *41/06***

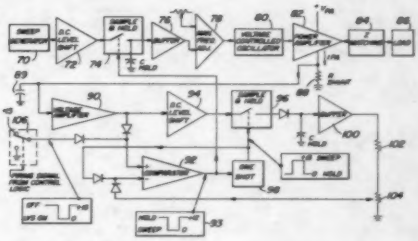
**U.S. Cl. 318—118** **8 Claims**

7. An electrical power supply having automatic frequency control for use with an electromechanical bonding device of the type employing ultrasonic frequency vibratory energy wherein the device has a mechanical resonant frequency which changes with the loading conditions, a mechanical standing wave is produced in the device by the resultant of the vibratory energy delivered to the work piece and the vibratory energy delivered back from the work piece, and a ratio (SWR) of the maximum to minimum amplitudes of the standing wave is a minimum at the resonant frequency comprising:

(a) a voltage controlled variable frequency oscillator for producing a variable frequency output signal, the oscillator having a frequency range encompassing at least the frequency range in which it is desired to drive the electromechanical device;

(b) a switching inverter for amplifying the output signal of the voltage controlled oscillator into a driving signal of the same frequency, the driving signal to be supplied to a transducer of the electromechanical device to drive the device at the driving signal frequency, the switching inverter having a current therethrough which is representative of the SWR;

(c) a sweep generator producing a periodic voltage signal having a frequency substantially less than the frequencies of the voltage controlled oscillator;




(d) means for producing a first electrical signal representative of the current through the switching inverter;

(e) means for producing a second electrical signal by increasing the direct current level of the first electrical signal by a fixed amount and then tapping a fixed percentage of the increased signal;

(f) a comparator amplifier receiving at one input the first electrical signal and receiving at the other input the second electrical signal, the comparator being biased to output a logic 1 signal whenever the second signal is greater than the first signal, and logic 0 signal whenever the second signal is less than or equal to the first signal;

(g) means for gating the signal from the sweep generator to the control input of the voltage controlled oscillator whenever the comparator amplifier output is a logic 1 signal, and for blocking the signal from the sweep generator to the control input of the voltage controlled oscillator whenever the comparator amplifier output is a logic 0; and

(h) means for holding the last voltage received by the control input of the voltage controlled oscillator whenever the comparator amplifier output is a logic 0.

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**4,389,602**

## ELECTRIC MOTOR CONTROLLER

**Stephen F. Post, Pleasant Hill, Calif., assignor to William M. Brobeck & Associates, Berkeley, Calif.**

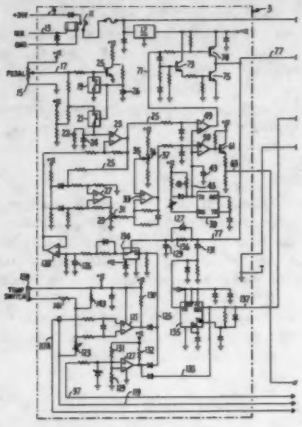
**Filed Feb. 20, 1981, Ser. No. 236,231**

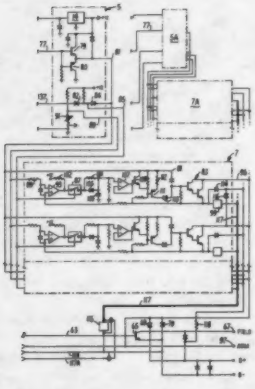
**Int. Cl.³ H02P *7/28***

**U.S. Cl. 318—341** **7 Claims**

1. In a motor controller for a direct current motor, said controller having a chopper for generating a series of pulses and pulse-width controlling means whereby the off time between pulses can be controlled, said chopper generating a signal to control a plurality of parallel output transistors the

improvement comprising current limit means for each of said output transistors, said current limit means including a low value resistor in the emitter leg of each individual transistor





and means for sensing the voltage drop across each said individual resistor and reducing the drive to that particular transistor if said voltage drop exceeds a certain predetermined value.

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**4,389,603**

## WINDSHIELD WIPER SYSTEM FOR AN AUTOMOTIVE VEHICLE

**Kouichi Kogawa; Teruo Kawasaki, both of Yokohama, and Akitoshi Mimura, Tokorozawa, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan**

**Filed Feb. 12, 1981, Ser. No. 233,692**

**Claims priority, application Japan, Feb. 27, 1980, 55-22637**

**Int. Cl.³ H02P *1/04***

**U.S. Cl. 318—443** **14 Claims**

1. A windshield wiper system for an automotive vehicle which comprises:

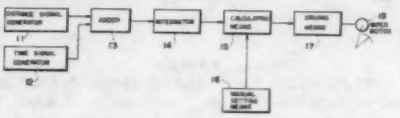
(a) a distance sensor for detecting a distance travelled by said vehicle and for outputting a train of distance signals;

(b) a time signal generator for generating a reference time interval signal;

(c) an adder for adding the distance signals from said distance sensor and the reference time interval signals from said time signal generator;

(d) an integrator for integrating the output from said adder; and

(e) a calculating means for comparing the signal from said integrator with a predetermined value and for outputting a



wiper driving signal when the signal reaches a predetermined value,

whereby intermittent time intervals of wiper operation can be controlled in accordance with the distance travelled and the time elapsed.

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**4,389,604**

## SEWING MACHINE INCORPORATING A PROGRAMMABLE CONTROL AND A LOW-INERTIA MOTOR

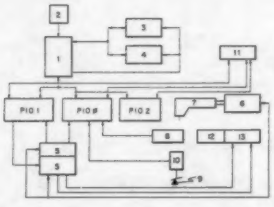
**Eduardo G. Blasco, Madrid, Spain, assignor to Industrias Y Confecciones, S.A. (INDUYCO), Madrid, Spain**

**Filed Feb. 3, 1981, Ser. No. 231,571**

**Claims priority, application Spain, Feb. 12, 1980, 488.504; Oct. 14, 1980, 495.935**

**Int. Cl.³ G05B *19/42***

**U.S. Cl. 318—568** **6 Claims**



1. A sewing machine, having a programmable control and a low inertia motor, comprising:

an upper microprogrammed controller comprising a microprocessor operatively connected to a static computer storage block and a dynamic computer storage block;

a plurality of input/output means operatively connected to respective sensor means, each of said sensor means providing an output related to a specific operating parameter of said sewing machine;

an electronic speed controller means for controlling the speed of said motor, said controller means operatively connected to and receiving signals from a digital/analog converter which is operatively connected to said upper microprogrammed controller;

a tachometer which is operatively electrically connected to said electronic speed controller means and which provides an output proportional to the speed of said motor;

said electronic speed controller means comprising an adjusting and control stage and a power distribution stage;

a tachometric feedback means operatively connected between said tachometer and said adjusting and control stage for providing a signal corresponding to the speed of said motor;

a current feedback means operatively connected to said motor and said adjusting and control stage for providing a signal corresponding to the current supplied to said motor;

said adjusting and control stage further receiving a reference signal generated by said digital/analog converter;

said power distribution stage comprising an alternating current to direct current converter means powered by an AC power source and operatively connected to a controlled direct current to alternating current converter means connected to the primary winding of a transformer whose secondary winding is connected an additional alternating current to direct current converter means connected to said motor;

said adjusting and control stage operatively connected to said controlled direct current to alternating current converter means and to said second alternating current to direct current converter means;

wherein said controlled direct current to alternating current converter means produces an output having a first frequency which is much higher than the frequency of said AC power source, whereby the size and weight of said transformer may be reduced;

and wherein said electronic speed controller controls the speed of the motor in dependence upon a comparison between said tachometric feedback signal and said reference signal and in dependence upon said current feedback means.

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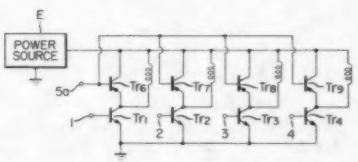
**4,389,605**

## PULSE MOTOR DRIVING APPARATUS

**Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 134,772, Mar. 28, 1980, abandoned.**
**This application Dec. 30, 1981, Ser. No. 335,720**
**Claims priority, application Japan, Apr. 4, 1979, 54-40533**
**Int. Cl.³ G05B *19/40***
**U.S. Cl. 318—696** **19 Claims**




1. A pulse motor driving apparatus comprising:

resistor means having an electric resistance connected in series with the winding of a pulse motor and with rectifying means having a rectification characteristic to form a closed circuit and

control means connected in parallel with said resistor means and disposed to control said resistor means in such manner that at the time of low revolution of said pulse motor said resistor means may be short-circuited.

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**4,389,606**

## AUTOMATICALLY SYNCHRONIZED SYNCHRONOUS MOTOR DRIVE SYSTEM

**Richard L. Detering, Seattle, Wash., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 26, 1981, Ser. No. 228,643**
**Int. Cl.³ H02P *7/36***
**U.S. Cl. 318—712** **9 Claims**

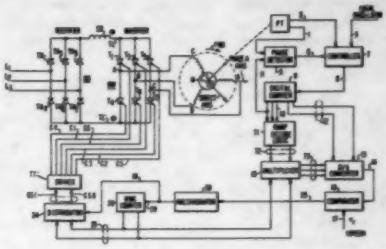
1. A variable speed synchronous motor drive system including a current-fed inverter having thyristors controlled to be turned ON under natural commutation by a variable frequency AC power voltage, comprising:

transducer means coupled to the rotor for providing a signal indicative of rotor position relative to the stator of the motor;

means associated with said rotor for deriving an actual velocity signal characteristic of motor speed;

counter means controlled by said velocity signal deriving means and locked with said transducer means for generating a time wave reference;

a comparator for establishing with said time wave reference and a voltage reference signal a firing angle;



a gate pulse generator responsive to said comparator for selectively applying a firing pulse to a thyristor "next" to be turned ON in a sequential order of said thyristors.

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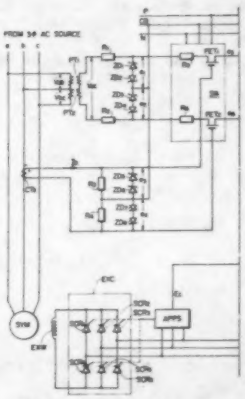
**4,389,607**

## SYNCHRONOUS MOTOR CONTROL DEVICE

**Nobuo Sekiyama, and Hisato Miyamura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 4, 1980, Ser. No. 184,068**
**Claims priority, application Japan, Sep. 5, 1979, 54-112980**
**Int. Cl.³ H02P *5/40***
**U.S. Cl. 318—717** **10 Claims**




1. A power factor detecting apparatus for a machine supplied with a three phase A.C. voltage comprising:

a potential transformer for detecting a line voltage applied to said machine;

a current transformer for detecting a phase current supplied to said machine, wherein said phase current is selected to have a phase difference of 90° with respect to said line voltage when said machine is operated at a power factor of 1;

first means for producing a first alternating current having a rectangular waveform with positive and negative polarities corresponding to an output of said potential transformer and for producing a second alternating current having a rectangular waveform with positive and negative polarities corresponding to said output of said potential transformer, wherein said first and second alternating currents are 180° out of phase with one another, and

wherein said first and second alternating currents have a substantially identical predetermined amplitude;

second means for producing first and second gate signals which have positive and negative polarities corresponding to an output of said current transformer and which are 180° out of phase with one another;

first switching means for passing said first alternating current to produce a first output signal having positive and negative polarities when said first gate signal has a predetermined polarity;

second switching means for passing said second alternating current to produce a second output signal having positive and negative polarities when said second gate signal has said predetermined polarity;

an adder for adding said first and second outputs of said first and second switching means to produce an adder output signal which has the positive and negative polarities and amplitude of said first and second output signals and a duty cycle of 90° when said machine is operated at a power factor of 1; and

a filtering means for removing an alternating current component from said adder output so that an output of the filtering means represents a power factor of said machine, wherein a first polarity of the output of the filtering means represents a leading power factor of said machine and wherein a second polarity of the output of the filtering means represents a lagging power factor, and further wherein a magnitude of the output of the filtering means represents a magnitude of the power factor of said machine.

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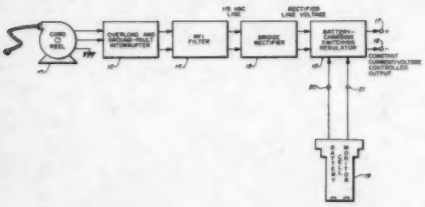
**4,389,608**

## TRANSFORMERLESS BATTERY CONTROLLED BATTERY CHARGER

**Ernest A. Dahl, 3247 Breaker Dr., Ventura, Calif. 93003, and George H. Barry, 21225 Saratoga Hills, Saratoga, Calif. 95070**

**Filed Sep. 30, 1981, Ser. No. 306,987**
**Int. Cl.³ H02J** *7/10*
**U.S. Cl. 320—33** **9 Claims**



1. A transformerless battery-controlled battery charging system, comprising:

a. an AC power supply for providing an AC line input to the charging system;

b. an RFI filter means connected in series with said AC line input;

c. an overload and ground-fault current interruptor means connected between said AC line input and said RFI filter means for providing user protection;

d. a rectifier means connected in series with the output from said RFI filter means;

e. current-and-voltage controlled battery charging switching regulator means connected to the rectified line voltage output from said rectifier means being operable for reducing the AC line voltage and for providing a constant-current/constant-voltage output throughout each AC cycle as required for the load formed by a battery being charged; said switching regulator means including an inductor which operates to store only a fraction of the energy in each charging pulse from each RC cycle with much of the battery charging energy being supplied directly from said AC power supply and not stored in the charging system; the switching regulator duty cycle being varied through each AC cycle to control input line current;

f. a remote enable input signal means which includes a battery cell monitoring means for sensing temperature, specific gravity, voltage, and electrolyte level conditions of each of the cells of the battery being charged;

g. said remote enable input signal means also being connected to said switching regulator means for providing external shutdown control in response to battery cell condition sensing signals from said battery cell monitoring means, as to any of over-temperature, over-voltage, required specific gravity, and low-electrolyte level;

wherein the requirement of each battery being charged is provided by said remote enable input signal means with sensing signal data received from all cells of the battery to provide higher-speed, constant current charging with a transformerless charging system.

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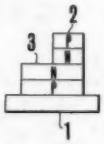
**4,389,609**

## BATTERY CHECK DEVICE

**Masaharu Kawamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 25, 1981, Ser. No. 324,808**
**Claims priority, application Japan, Dec. 3, 1980, 55-171287**
**Int. Cl.³ H02J** *7/00*
**U.S. Cl. 320—48** **5 Claims**




1. A battery check device comprising:

(a) display means, said means including a first and a second terminal for carrying out a display with colors in accordance with the level of the signals delivered to the respective terminals;

(b) first signal forming means for decreasing the output signal in accordance with the decrease of the power source voltage, the output signal of said means being delivered to the first terminal of the display means; and

(c) second signal forming means for increasing the output signal in accordance with the decrease of the power source voltage, the output signal of said means being delivered to the second terminal of the display means;

whereby the display means carries out the display with colors corresponding to the state of the power source voltage in accordance with the output signals from the first and the second signal forming means.

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**4,389,610**

## ELECTROSTATIC PROBE DEVICE AND METHOD OF MANUFACTURING SUCH A DEVICE

**Ulrich Schiebel, Aachen-Brand, and Dieter Wädow, Aachen-Hahn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

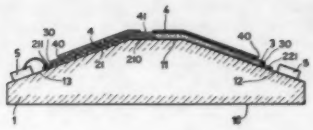
**Filed Nov. 28, 1980, Ser. No. 210,954**
**Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948660**
**Int. Cl.³ G01R** *31/02*
**U.S. Cl. 324—72.5** **15 Claims**

1. An electrostatic probe device for measuring charge distribution on an electrically charged surface comprising

an electrically insulating substrate,

a plurality of adjacent, mutually insulated, and mutually

extending electrostatic probe electrodes on said substrate, each of said probe electrodes including a probe electrode head, an electrode track, and a connection electrode surface,



a coherent insulating layer provided over at least said probe electrode head of said probe electrodes, and

an electrically conductive cover layer provided on said insulating layer, said cover layer having an opening over said probe electrode head of each of said probe electrodes.

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**4,389,611**

## APPARATUS FOR DISPLACING A SENSOR INTO A TUBE AND AUTOMATICALLY RETURNING IT

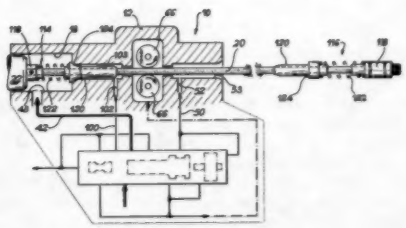
**Michel Pigeon, Bures sur Yvette; Claude Vienot, Fontenzy sous Bois, and Robert Saglio, Antony, all of France, assignors to Commissariate a l'Energie Atomique, France**

**Filed Sep. 25, 1980, Ser. No. 190,876**

**Claims priority, application France, Sep. 27, 1979, 79 24048**

**Int. Cl.³ G01R *33/12*; G01N *27/90*; B65H *49/00***

**U.S. Cl. 324—220** **12 Claims**



1. An apparatus for displacing and controlling a sensor for tubes, particularly an eddy current sensor, comprising, a cable to which said sensor is connected, means for engaging and displacing said cable, front and rear detection means for detecting front and rear extreme positions of the sensor in the tube, a pressurized fluid source, and an automatic control system operated by a pressurized fluid, said control system comprising at least one box defining at least one bore therewithin, and at least one slide valve slidingly received within said bore, said box having an inlet which communicates with said pressurized fluid source and at least one outlet which is adapted to communicate with the tube to be inspected, the outlet located behind said sensor, and means for actuating said cable engaging and displacing means, said actuating means being sensitive to the position of the slide valve in said bore, said slide valve being sensitive to the operation of said front and rear detection means for sliding within said bore, in order either to communicate the inlet with the outlet, or to actuate said cable engaging and displacing means, respectively.

**4,389,612**

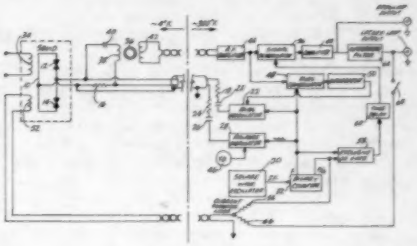
## APPARATUS FOR REDUCING LOW FREQUENCY NOISE IN DC BIASED SQUIDS

**Michael B. Simmonds, Del Mar, and Robin P. Giffard, Palo Alto, both of Calif., assignors to S.H.E. Corporation, San Diego, Calif.**

**Filed Jun. 17, 1980, Ser. No. 160,225**

**Int. Cl.³ G01R *33/02***

**U.S. Cl. 324—248** **15 Claims**



1. A low noise superconducting circuit for measuring magnetic flux comprising a superconducting device including a pair of Josephson junctions and superconductors connecting the junctions in a closed loop, means applying a bias current through the two junctions in parallel, means reversing the bias current direction through the junction periodically at a first frequency, means for generating magnetic flux linking the closed loop, means modulating said flux at a second frequency which is different from said first frequency, demodulating means responsive to reference signals at said first and second frequencies, and means coupling the voltage across said junctions to said demodulating means, the demodulated output providing an output signal whose amplitude is determined by the level of magnetic flux linking the loop.

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**4,389,613**

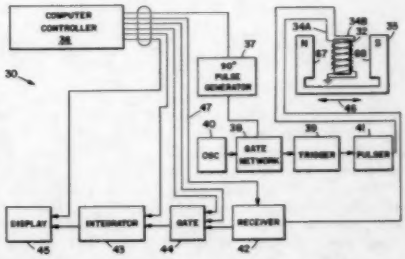
## COMPUTER-CONTROLLED, PORTABLE PULSED NMR INSTRUMENT AND METHOD OF USE

**Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Apr. 15, 1981, Ser. No. 255,979**

**Int. Cl.³ G01R *33/08***

**U.S. Cl. 324—303** **18 Claims**




1. Automatic apparatus for swiftly determining fluid-flow properties of a rock sample based on NMR response of hydrogen nuclei of interstitial fluids within pore spaces of said sample in which DC field inhomogeneity and phase background jitter are used to increase data-throughput efficiency (DTE) comprising:

(a) magnet means for producing a DC magnetic field acting on said rock sample, said magnetic field having an inten-

sity of at least 1 kilogauss and an inhomogeneity of at least D gauss to provide a series of nuclear magnetization build-ups associated with said interstitial fluids within said sample as a function of time;

(b) RF coil means acting at right angles to said DC magnetic field;

(c) transmitter means including digital control means for generating a first series of digital control codes associated with a series of RF magnetic pulses of selected frequency, amplitude and duration, connected to said RF coil means to produce said series of RF magnetic pulses for interrogating said sample, said amplitude of each pulse being controlled to be at least greater than the variation D in said DC field over said sample;

(d) receiver means connected to said digital control means and to said RF coil means for generating via a second series of digital control codes associated with a plurality of time windows, output signals proportional to said nuclear magnetic resonance response of said interstitial fluids;

(e) said transmitter means including said digital control means having a phasal background jitter characteristic associated therewith that randomly varies with time so that said sample can be repetitively interrogated to serially indicate nuclear magnetization relaxation without need for applying rescrambling reversing RF magnetic field pulses prior to the start of each magnetization build-up cycle.

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**4,389,614**

## METHOD AND APPARATUS FOR GENERATING PULSES OF A PREDETERMINED TIME RELATION WITHIN PREDETERMINED PULSE INTERVALS WITH A HIGH TIME RESOLUTION

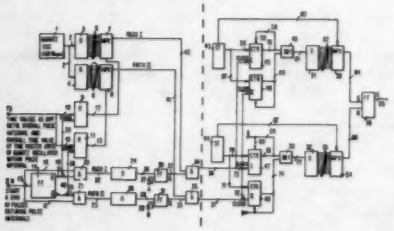
**Dieter E. Staiger, Weil im Schoenbuch, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 18, 1981, Ser. No. 264,251**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023699**

**Int. Cl.³ H03K** *3/70, 3/78, 3/86, 5/06*

**U.S. Cl. 328—61** **17 Claims**



1. A method for generating, without dead time, pulses appearing in successive pulse intervals, the pulse intervals and pulses being generated with precise time resolution, said method being characterized in:

that the signals characterizing start (IINA1, IIN2A) and end (IIN1E, IIN2E) of a pulse interval are generated under storage control by an oscillator (1) for providing coarse time raster values, and by a delay circuit (3, 4) arranged in series with the oscillator (1), with selective (7, 8) delay circuit taps (5, 6) for fine time raster values;

that the signals characterizing the pulse intervals are alternatingly applied to a respective one of two paths (path I, path II) in such a manner that the signal characterizing the respective beginning of the pulse interval is in accordance with the time raster value given by the oscillator (1);

that for each path the leading and trailing edge of a pulse to be generated during a pulse interval is derived via counters (45, 47, 46, and 48) driven by an oscillator clock and loadable with a count from a store (43, 44) when a specific count is reached; and

that for generating the leading and trailing edge (45, 46 respectively 47 and 48) a common delay circuit (51 and 52, respectively) with store-controlled (43, 44), selectively addressable delay circuit taps (62, 79 respectively) is arranged in series to the counters for a fine time raster, and that the pulse information generated in accordance with both paths is joined on a common line (65).

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**4,389,615**

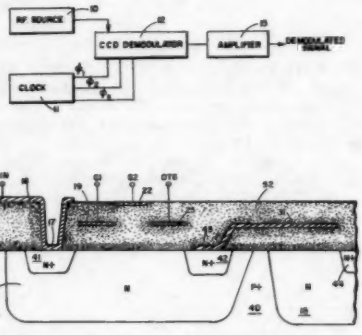
## CCD DEMODULATOR CIRCUIT

**Barry T. French, Fullerton, and Michael J. McNutt, Yorba Linda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Continuation of Ser. No. 70,560, Aug. 29, 1979. This application May 17, 1982, Ser. No. 379,244**

**Int. Cl.³ H03D** *1/00, 3/18*

**U.S. Cl. 329—101** **14 Claims**






1. A charge coupled demodulator circuit including a radio frequency input, and an output, comprising:

first input means for introducing into a first position of said circuit a predetermined amount of charge;

storage well means functioning to store a predetermined amount of charge in a second portion of said circuit spaced apart from said first portion;

second input means for introducing a time-varying radio frequency signal having a frequency f containing information in the form of amplitude modulation into the circuit; said second input means functioning to cause charge to be transported during a first time interval from said first portion to said second portion, and during a subsequent second time interval from said second portion in the direction of said first portion, so that at the end of a single first and a predetermined plurality of subsequent successive second time intervals corresponding to a plurality of cycles of said radio frequency signal a quantity of charge remains in said storage well representative of the demodulated amplitude of said time-varying radio frequency signal; and

sampling means connected to said storage well for sampling and transferring at a sampling frequency less than said frequency f said quantity of charge remaining in said storage well means during a third time interval subsequent to said predetermined plurality of second time intervals to said output.

4,389,616

## METHOD AND ARRANGEMENT FOR THE DIGITAL REGULATION OF THE CARRIER PHASE ERROR IN RECEIVERS OF DATA TRANSMISSION SYSTEMS

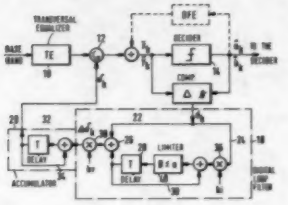
Heinz Göckler, Backnang, and Hagen Hofmeister, Korb, both of Fed. Rep. of Germany, assignors to Aeg-Telefunken AG Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 217,519

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950339

Int. Cl.³ H04L 27/22

U.S. Cl. 329—104 9 Claims



1. In a method for digitally regulating the carrier phase error in receivers of digital data transmission systems including the steps of: feeding sampled data values of the carrier demodulated input signal of the receiver to a decider to provide estimated values for each associated sampling time; comparing the sampled value of the demodulated input signal with the associated estimated value for each sampling time to determine a deviation value which is a measure for the phase difference between said sampled value said associated estimated value; filtering said deviation value in a digital loop filter including parallelly connected proportional and integral circuit branches; accumulating the output values of said digital loop filter to provide a regulating value; and using said regulating value to correct the carrier phase error of the demodulated input signal; the improvement comprising including a non-linear limit on the said deviation value being integrated over time in said integral branch of said digital loop filter.

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4,389,617

## COMBINATION RING CAVITY AND BACKWARD RAMAN WAVEGUIDE AMPLIFIER

Norman A. Kurnit, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1981, Ser. No. 243,309

Int. Cl.³ H03F 7/00, 7/05; H01S 3/30

U.S. Cl. 330—4.3 6 Claims

1. A combination regenerative ring and backward Raman waveguide amplifier comprising:

$CO_2$ laser means for producing a $CO_2$ laser pump signal;

Stokes radiation source means for producing a Stokes radiation signal;

means for combining said $CO_2$ laser pump signal and said Stokes radiation signal to produce a combined copropagating $CO_2$ laser pump signal and Stokes radiation signal;

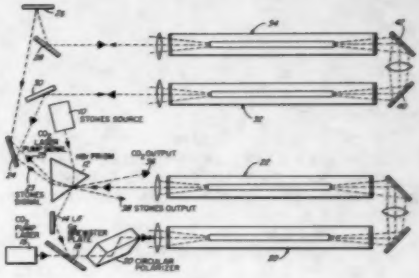
means for directing said copropagating $CO_2$ laser pump signal and Stokes radiation signal through Raman waveguide amplifier means to produce an amplified Stokes radiation signal by Raman scattering of said $CO_2$ laser pump signal using rotational transitions in a diatomic molecular gas;

means for splitting said amplified Stokes radiation signal and said $CO_2$ laser pump signal into first and second portions;

means for combining said first portion of said amplified Stokes radiation signal with said combined copropagating $CO_2$ laser pump signal and said Stokes radiation signal in a single beam path to increase the intensity of Stokes radiation in said regenerative ring amplifier and thereby increase the amount of energy extracted from said $CO_2$ laser pump signal;

means for directing said second portion of said amplified Stokes radiation signal through backward Raman waveguide amplifier means in a first direction;

means for directing said second portion of said $CO_2$ laser pump



signal through said backward Raman waveguide amplifier means in a second direction, opposite to said first direction, so that said $CO_2$ laser pump signal and said amplified Stokes radiation signal counterpropagate through said backward Raman waveguide amplifier means to produce backward Raman amplification, pulse compression, and efficient energy extraction from said $CO_2$ laser pump signal.

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4,389,618

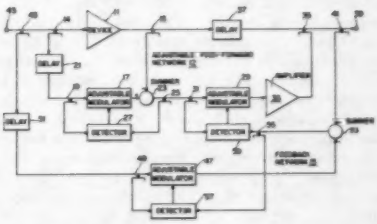
## ADAPTIVE FEED-FORWARD SYSTEM

Ronald M. Bauman, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1981, Ser. No. 254,353

Int. Cl.³ H03F 1/26

U.S. Cl. 330—149 10 Claims



1. An adaptive feed-forward system for reducing the distortion generated by a device such as an amplifier, the feed-forward system comprising:

first sampling means adapted to be connected to the device for extracting a sample of the distortion products from the output of the device;

an adjustable equalizing means connected to the first sampling means for equalizing the sample and the products remaining in the output of the device after extracting the sample;

combining means connected to the first equalizing means and adapted to be connected to the device for subtractively combining the equalized sample and the remaining products to produce a distortion reduced system output;

second sampling means for extracting a sample of the system output;

proportion-changing means connected to the second sampling means for increasing the proportion of distortion in the extracted sample of the system output; and

control means connected to the first sampling means, to the proportion-changing means, and to the equalizing means for correlating the distortion-increased sample of the system output with the sample of the distortion products extracted from the output of the device by the first sampling means and adjusting the first equalizing means to minimize the correlation result.

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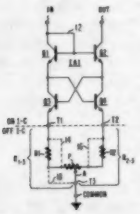
**4,389,619**

## ADJUSTABLE-GAIN CURRENT AMPLIFIER FOR TEMPERATURE-INDEPENDENT TRIMMING

**Allen L. Limberg, Titusville, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Feb. 2, 1981, Ser. No. 230,383**
**Int. Cl.³ H03F** *3/04*
**U.S. Cl. 330—288** **17 Claims**



1. A current amplifier with adjustable current gain comprising:

a substrate having input and output terminals, and having first and second terminals thereon;

a common terminal external to said substrate;

first, second, third and fourth transistors of like conductivity type arranged on said substrate, each having respective input, output and common electrodes, the respective output electrodes of said first and second transistors being respectively coupled said input and output terminals, the respective common electrodes of said third and fourth transistors respectively connecting to said first and second terminals, the respective common electrodes of said first and second transistors connecting to the respective output electrodes of said third and fourth transistors, respectively;

means for applying a potential at the common electrode of said first transistor to the input electrode of said fourth transistor;

means for applying a potential at the common electrode of said second transistor to the input electrode of said third transistor;

means for applying a potential at said input terminal to the respective input electrodes of said first and second transistors to condition said first and second transistors for conduction;

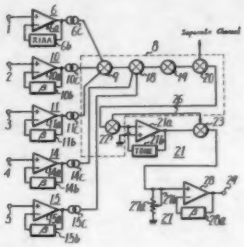
first and second resistance means located external to said substrate, said first resistance means being coupled between said first and common terminals and said second resistance means being coupled between said second and common terminals, said first and second resistance means exhibiting respective resistances in proportion substantially unaffected by temperature, at least one of said first and second resistance means including means for adjusting the resistance thereof.

**4,389,620**

## CURRENT TRANSFER AMPLIFIER

**Kazuo Yamaguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jan. 27, 1981, Ser. No. 228,960**
**Claims priority, application Japan, Jan. 29, 1980, 55-8949; Jan. 29, 1980, 55-92908; Jan. 29, 1980, 55-9689**
**Int. Cl.³ H03F** *3/04;* **H03H** *5/00*
**U.S. Cl. 330—304** **10 Claims**



1. A current transfer amplifier comprising:

voltage signal source means for supplying a voltage signal to be amplified;

voltage/current converting means supplied with the voltage signal from said voltage source means for converting the samed into a current signal proportional to the voltage signal;

a tone control circuit of a current amplification type supplied with the current signal from said voltage/current converting means;

a non-linear switching element interposed between the output of said voltage/current converting means and the input of said tone control circuit to transmit said current signals therethrough; and

a variable resistor having a pair of terminals connected between the output of said tone control circuit and a reference point to convert the output signal of said tone control circuit into voltage signal.

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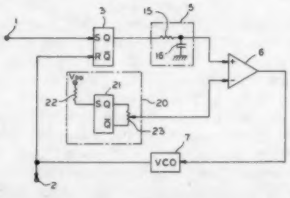
**4,389,621**

## PHASE LOCKED LOOP STABILIZED AGAINST TEMPERATURE AND VOLTAGE VARIATIONS

**Godo Futatsuishi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 45,944, Jun. 6, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,235**
**Claims priority, application Japan, Jun. 15, 1978, 53/82785**
**Int. Cl.³ H03L** *7/08*
**U.S. Cl. 331—1 A** **4 Claims**



3. A phase-locked loop circuit comprising: a voltage-controlled oscillating means for varying its oscillating frequency in response to a certain control signal; a first logic means for generating pulses having pulse width proportional to the phase difference between applied input pulses and the output of said oscillating means; means for filtering the output of said first

logic means; a second logic means for providing a high d.c. level signal and a low d.c. level signal; means for combining said high and low d.c. levels into a predetermined synthesized d.c. level signal; and means for generating said control signal corresponding to the level difference between the outputs of said filtering means and said combining means.

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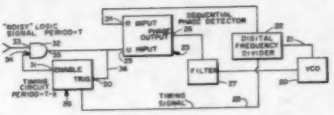
4,389,622

## SYSTEM FOR PREVENTING TRANSIENT INDUCED ERRORS IN PHASE LOCKED LOOP

Gerald M. Kackman, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 28, 1981, Ser. No. 306,272
Int. Cl.³ H03L 7/08; H04L 27/12
U.S. Cl. 332—19 26 Claims




1. A method of minimizing synchronization errors in a phase-locked loop having a sequential phase detector for determining the phase difference between the output of the VCO of the phase-locked loop and a periodic control signal having a characteristic control signal cycle period, wherein said errors are caused by distortion in the control signal, comprising the steps of:

enabling the control signal input to said sequential phase detector for a relatively short enable time window comprising a small fraction of the control signal cycle period, said enable time window beginning just before a control signal is anticipated;

limiting the response of said phase detector to the first one of any control signals from said control signal input during any given enable time window;

disabling said control signal input for the remainder of said control signal period.

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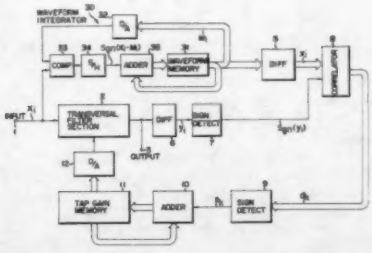
4,389,623

## AUTOMATIC EQUALIZER UTILIZING A PERIODICALLY CONTAINED REFERENCE SIGNAL

Shunichi Onishi, Yokohama; Masaharu Obara, Tokyo; Masaru Sakurai; Junzo Murakami, both of Kawasaki, and Shinichi Makino, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Nippon Hoso Kyokai, Tokyo, both of, Japan

Filed May 18, 1981, Ser. No. 264,407
Claims priority, application Japan, May 28, 1980, 55-71018
Int. Cl.³ H04B 3/10; H04N 5/21
U.S. Cl. 333—16 2 Claims




1. An automatic equalizer comprising:

a transversal filter connected to receive an input signal in which a predetermined reference signal is periodically contained and having variable tap gains;

a waveform integrator circuit means connected to receive the input signal for integrating the waveform of the reference signal;

a correlator means responsive to the output of said transversal filter and waveform integrator circuit means; and

a circuit means responsive to said correlator means to correct the tap gains of said transversal filter.

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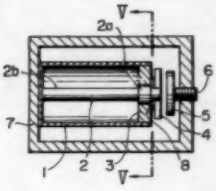
4,389,624

## DIELECTRIC-LOADED COAXIAL RESONATOR WITH A METAL PLATE FOR WIDE FREQUENCY ADJUSTMENTS

Yukichi Aihara, Kawasaki, and Sadahiko Yamashita, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 3, 1981, Ser. No. 251,967
Claims priority, application Japan, Apr. 4, 1980, 55-44885
Int. Cl.³ H01P 7/04
U.S. Cl. 333—226 6 Claims




1. A coaxial resonator comprising, an outer conductor having a closed end and an open end, an inner conductor extending concentrically in said outer conductor and connected therewith in a short circuit at said closed end and in an open circuit at said open end, a dielectric member disposed in said open circuit between said outer and inner conductors, a first conductive plate connected to the open circuit end of said inner conductor and having a larger surface area than the transverse cross-sectional area of said inner conductor, and a second conductive plate having a smaller surface area than the surface area of said first conductive plate and disposed between said dielectric member and said first conductive plate while making contact with said inner conductor.

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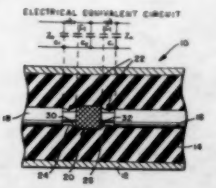
4,389,625

## ELECTRICAL CONNECTOR HAVING A CAPTIVATED, ELECTRICALLY COMPENSATED INNER CONDUCTOR

Norbert J. Sladek, Fairfield; Roger P. Avery, Redding, and Saverio T. Bruno, Danbury, all of Conn., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 918,893, Jun. 26, 1978, abandoned.
This application Apr. 9, 1980, Ser. No. 138,696
Int. Cl.³ H01R 17/04; H02G 15/00
U.S. Cl. 333—260 12 Claims




1. In an electrical connector having a first conductor disposed within an axially extending opening through a dielectric

member disposed adjacent a second conductor, the improvement comprising:

means for captivating said first conductor against axial and rotational movement within said axially extending opening;

said captivating means having an electrical impedance between said captivating means and said second conductor differing from the characteristic electrical impedance of said first conductor between said first conductor and said second conductor; and

means for compensating for the differing electrical impedance of said captivating means to optimize the voltage standing wave ratio of said electrical connector;

said dielectric member being deformable to permit radial expansion of said axially extending opening and wherein said captivating means includes at least one enlarged portion of said first conductor for radially expanding said axially extending opening to retain said first conductor in an interference fit in said axially extending opening, said enlarged portion of said conductor having an electrical impedance between said first conductor and said second conductor less than the characteristic electrical impedance of the remainder of said first conductor between said first conductor and said second conductor.

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**4,389,626**

## ELECTROMAGNETIC RELAY WITH ADJUSTABLE CONTACTS IN A CLOSED CONTACT CHAMBER

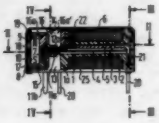
**Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 20, 1981, Ser. No. 323,283**

**Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3102011**

**Int. Cl.³ H01H** *51/22*

**U.S. Cl. 335—78** **10 Claims**



1. An electromagnetic relay comprising:

a one-piece coil core body comprised of insulating material and having a hollow interior and a closed end face and a partially open end face;

a ferromagnetic movable contact element having a first end secured in said closed end face of said coil core body, said movable contact element being disposed substantially parallel to a longitudinal axis of said coil core body;

a contact chamber communicating with said hollow interior of said coil core body disposed adjacent to said partially open end face of said coil core body; and

an encapsulation wall for said contact chamber coincident with said partially open end face,

said encapsulation wall having a first part which is a projection of said one-piece coil body and carrying a first stationary contact plate, and a second part which is separately fabricated and inserted in said encapsulation wall for closing said contact chamber, said second part carrying a second contact plate, said first and second parts having a boundary extending through said longitudinal axis, and

each of said first and second parts having a continuous recess extending from an exterior of said relay to a respective one of said first and second contact plates for permitting external adjustment of the position of said contact plates after closure of said contact chamber.

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**4,389,627**

## CHANGEOVER SWITCH FOR ACTUATING A PLURALITY OF REED SWITCHES DISPOSED IN A CIRCLE

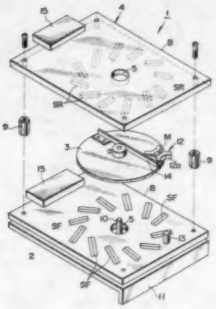
**Toshiaki Uesugi, and Toshikazu Inden, both of Oi, Japan, assignors to Chino Works, Ltd., Saitama, Japan**

**Filed Nov. 19, 1981, Ser. No. 323,074**

**Claims priority, application Japan, Nov. 19, 1980, 55-164633**

**Int. Cl.³ H01H** *36/00*

**U.S. Cl. 335—206** **8 Claims**



1. A changeover switch comprising

at least one substrate;

a permanent magnet defining an axis of polarity and revolving about a first axis in a circle in proximity to said substrate, said permanent magnet being rotatable about a second axis in the circle around which said permanent magnet revolves;

a plurality of reed switches mounted on said substrate, said reed switches being disposed in a circle having its center lying on the first axis of revolution of said permanent magnet and switched on and off alternately in response to the magnetic lines of force of said permanent magnet when the axis of polarity of said magnet is aligned with said reed switches; and

a means for intermittently rotating said permanent magnet a predetermined angle about said second axis during each revolution of said magnet about said first axis, thereby deviating the axis of polarity of said permanent magnet with respect to said reed switches and placing said reed switches under actuated or unactuated conditions in dependence on the rotation of said permanent magnet about said second axis.

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**4,389,628**

## THERMO-MAGNETICALLY OPERATED SWITCHES HAVING TWO DIFFERENT OPERATING TEMPERATURES

**Hiroyasu Sato; Yoshiharu Sato, and Tetsuro Baba, all of Sendai, Japan, assignors to Tohoku Metal Industries, Ltd., Miyagi, Japan**

**Filed May 29, 1981, Ser. No. 268,132**

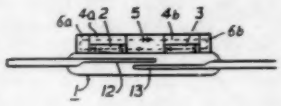
**Claims priority, application Japan, Jun. 2, 1980, 55-75140[U]; Jun. 4, 1980, 55-76620[U]; Jun. 4, 1980, 55-76621[U]; Jun. 12, 1980, 55-82137[U]; Jun. 12, 1980, 55-82138[U]**

**Int. Cl.³ H01H** *36/00*

**U.S. Cl. 335—208** **20 Claims**

1. In a thermo-magnetically operated switch having two different and predetermined lower and higher operating points on a temperature scale so that the switch may be maintained

open below the lower operating point and above the higher operating point and be maintained closed between the two different operating points, which includes an elongated reed switch having a pair of ferromagnetic reeds hermetically sealed in an envelope with free ends of said reeds overlapped for opening and closing movements relative to one another, two permanent magnets having Curie points higher than said higher operating point and disposed alongside said reed switch over the respective reeds in similar polar directions, a first ferromagnetic body having a Curie point corresponding to said higher operating point and disposed over said overlapped ends




of said reeds and in an axial space between said two magnets to engage said two magnets, and second ferromagnetic body means having a Curie point corresponding to said lower operating point and disposed alongside said two magnets to short-circuit magnetically said two magnets at the temperature of said lower operating point or below, the improvement comprising two third ferromagnetic bodies having Curie points of said lower operating point or above and disposed to engage axial opposite ends of said second ferromagnetic body means and the other pole faces of said magnets opposite the pole faces thereof engaging said first ferromagnetic body.

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**4,389,629**

## ELECTRICAL SWITCH WITH A THERMOSTATIC WORKING ELEMENT AS THE ACTUATING ELEMENT, AND A SWITCH ELEMENT IN THE FORM OF A MICROSWITCH

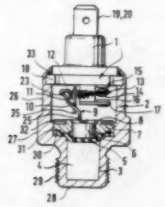
**Roland Saur, Stuttgart, and Manfred Kurz, Ditzingen, both of Fed. Rep. of Germany, assignors to Behr-Thomson Dehnstoffregler GmbH, Fed. Rep. of Germany**

**Filed Feb. 18, 1982, Ser. No. 349,815**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109133**

**Int. Cl.³ H01H *71/18***

**U.S. Cl. 337—126** **20 Claims**



**1.** Electrical switch with a thermostatic actuating element and with a microswitch element, said microswitch element being mounted in a one-piece metal housing that has a round cross section and is open at one end, said housing having a recess in an opposite, bottom, end; a substance which expands when heated, being located in said recess and being covered by a rubber-elastic membrane; a guide part having an axial bore being mounted so as to hold said membrane to said housing; a working piston made of an insulating material being located upon said membrane in a manner displaceable as a result of an expansion of said substance, said piston being guided in said axial bore of the guide part; a rocker pivotably mounted on a rocker support so as to pivot about an axis which runs at right angles to the displacement direction of the working piston, said rocker having one end engageable by an end of said piston facing away from said membrane and having an arm on an opposite end to which an extension spring, which serves as a restoring means for the working piston, is attached, said spring also being attached to a contact tongue that is pivotably supported against the rocker support, said tongue being directed essentially at right angles to the displacement direction of the piston and bearing a contact which faces a normally closed (NC) contact on one side and a normally open (NO) contact on an opposite side, and which is held in place by a contact support; and a circular plate, made of an insulating material, sealing the open end of the housing, said plate carrying the NC contact, a contact support carrying the NO contact and the rocker arm support, and through which electrical leads from at least one of the rocker and NO contact supports is guided to the outside of the housing; characterized by the fact that the NO contact support, viewed in the displacement direction of said piston, is disposed laterally next to said contact tongue and is displaced relative to the middle of said plate.

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**4,389,630**

## SNAP ACTION THERMALLY RESPONSIVE SWITCH

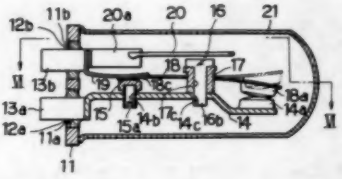
**Susumu Ubukata, 549 Nakasuna-cho, Tenpaku-ku, Nagoya; Yasukazu Mizutani, Nagoya, and Syozo Iyada, Nagoya, all of Japan, assignors to Susumu Ubukata, Nagoya, Japan**

**Filed Mar. 6, 1981, Ser. No. 241,062**

**Claims priority, application Japan, Mar. 15, 1980, 55-32882; Jun. 10, 1980, 55-78128; Aug. 7, 1980, 55-108835; Sep. 2, 1980, 55-122165**

**Int. Cl.³ H01H *37/54***

**U.S. Cl. 337—363** **10 Claims**




**1.** A snap-action thermally responsive switch that comprises:

a multi-metallic thermally responsive strip element including a first end, an opposite second end, a central portion integral with said first and second ends, an upper surface and a lower surface,

a moveable contact fixed to said lower surface at said first end,

a fixed contact secured to a stationary member for engagement and disengagement with said moveable contact,

an elastic member upon which said second end of said strip member is supported,

a first support member that osculates said second end of said strip member and exerts thereon a biasing force against said lower surface,

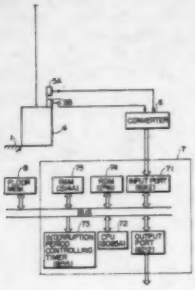
a second support member that osculates said central portion of said strip member and exerts a biasing force against said upper surface of said strip member,

said strip member being unfixed to said first and second support members permitting relative movement therebetween when said strip member undergoes snap-action.

## 4,389,631
## ELEVATOR POSITION DETECTING DEVICE

Ryuichi Kajiyama, and Shigemi Iwata, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,749
Claims priority, application Japan, Jan. 7, 1980, 55-454
Int. Cl.[3] B66B *3/02*
U.S. Cl. 340—21 8 Claims



1. An elevator position detecting device comprising:

a position-between-floors detector provided on an elevator cage;

a plurality of engaging members for said detector, one of said engaging members being disposed between each two adjacent floors; and

electronic calculating means having inputs coupled to outputs of said detector, said calculating means being programmed such that a digital value corresponding to one floor is added or subtracted from a floor memory of said calculating means to detect the position of said cage thereby to provide a cage position signal, wherein during movement of said cage in one direction, said digital value corresponding to one floor is added to said floor memory whenever said detector meets each said engaging member, and during movement of said cage in the other direction, said digital value corresponding to one floor is subtracted whenever said detector leaves each said engaging member.

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## 4,389,632
## FLASHER UNIT WITH SYNCHRONIZATION AND DAYLIGHT CONTROL

Robert L. Seidler, 104 Ridgewood Dr., Longwood, Fla. 32750

Filed Jun. 25, 1981, Ser. No. 277,087
Int. Cl.[3] B60Q *1/26;* H05B *39/00*
U.S. Cl. 340—74 13 Claims

1. Apparatus for producing a preselected sequence of flashes and eclipses from a lamp comprising:

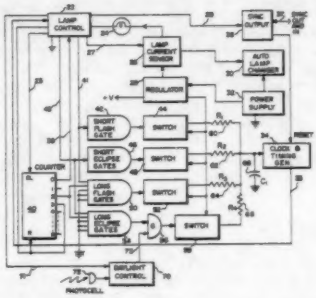
lamp control means connected to said lamp for energizing said lamp during a flash period;

timing generator means connected to said lamp control means for producing a start timing pulse for starting a flash period and a stop timing pulse for terminating a flash period;

flash period control means connected to said timing generator means for controlling the time between said start timing pulse and said stop timing pulse, said flash period control means having a set of short flash gates connected to said lamp control means and enabled by said lamp control means when a short flash is required, said short flash gates having a short flash control input and a set of long flash gates connected to said lamp control means and enabled by said lamp control means when a long flash is required, said long flash gates having a long flash control input;

eclipse period control means connected to said timing generator means for controlling the time between said stop timing pulse and said start timing pulse, said eclipse period control means having a set of short eclipse gates connected to said lamp control means, and enabled by said lamp control means when a short eclipse is required, said short eclipse gates having a long eclipse control input;

counter means having a set of sequential count outputs, the number of said count outputs selected to be equal to the number of flashes in said preselected sequence, each of said count outputs connected to selected ones of said flash and eclipse gate control inputs for controlling said flash period and said eclipse period to produce the durations of the flash and the eclipse preselected for each position in said preselected sequence, said counter means having its



clocking input connected to said timing generator means for receiving each of said start timing pulses to cause each count output to have a duration equal to the time between its clocking start timing pulse and the next clocking start timing pulse;

a set of electronic switch means having switches connected respectively to the outputs of said short flash gates, said short eclipse gates, said long flash gates, and said long eclipse gates; and

a series resistance-capacitance timing circuit having the capacitance thereof connected to all of said electronic switch means, and in which the resistance thereof is a separate resistor connected to each of said electronic switch means whereby enabling of one of said gates causes the associated one of said electronic switches to close to thereby connect the one of said resistors associated with said closed gate in series with said capacitance to establish a selected long or short duration.

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## 4,389,633
## CODED APERTURE IMAGING WITH SELF-SUPPORTING UNIFORMLY REDUNDANT ARRAYS

Edward E. Fenimore, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1980, Ser. No. 191,192
Int. Cl.[3] G01T *1/00*
U.S. Cl. 382—26 2 Claims

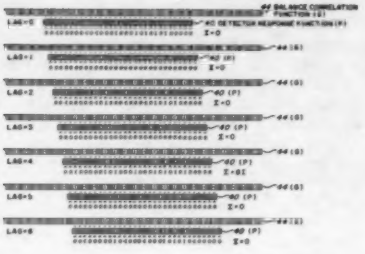
1. A self-supporting uniformly redundant array aperture imaging device for imaging a source of nonfocusable radiation comprising:

a self-supporting uniformly redundant array aperture having holes which are of a size equal to c/n where c is the spacing between possible hole locations and n is an integer, said holes of said self-supporting uniformly redundant

array formed at corresponding positions within hole locations of said uniformly redundant array;

means for detecting said nonfocusable radiation imaged by said uniformly redundant array;

means for balance correlating information from said means



for detecting to generate a decoded image of said source of said nonfocusable radiation, said means for balance correlating information from said means for detecting comprising a balance correlation function wherein holes are represented by 1, nonholes are represented by −1, and supporting area is represented by 0.

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**4,389,634**

## CHARACTER READING APPARATUS

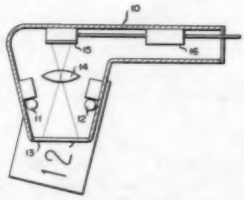
**Yoshikatsu Nakamura, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Tokyo Electric Co., Ltd., Tokyo, both of, Japan**

**Filed Nov. 14, 1980, Ser. No. 206,832**

**Claims priority, application Japan, Nov. 16, 1979, 54-147664; Nov. 16, 1979, 54-147667**

**Int. Cl.³ G06K 9/22**

**U.S. Cl. 382—11** **7 Claims**



1. A character reading apparatus comprising:

photoelectric converting means having a two-dimensional array of photoelectric converting elements and manually moved for periodically and optically scanning a character and periodically producing character pattern data;

character pattern identifying means for executing identification process on the basis of the character pattern data from said photoelectric converting means;

first memory means storing conditional data for defining a range of size of a character pattern capable of being identified;

second memory means; and

a control circuit means including character size detection means connected to receive a character pattern data from said photoelectric converting means and derive character pattern size data from each character pattern data generated from said photoelectric converting means, judging means for checking whether or not the character pattern data from said photoelectric converting means meets the condition defined by said conditional data stored in said first memory means, said judging means producing an output signal when detecting that the character pattern data from said photoelectric converting means meets the condition defined by said conditional data stored in said first memory means; and comparator means for comparing, in response to the output signal from said judging means, data from said second memory means and character pattern size data from said character size detection means; said comparator means producing, when it is detected that the character pattern size data from said character size detection means is greater than the data from said second memory means, an output signal to said second memory means for causing the data from said character size detection means to be stored in said second memory means, and said control circuit producing an output signal after an output signal is produced from said comparator means, to set said character pattern identifying means to an initial state for causing identification process to be started on the basis of the character pattern data from said photoelectric converting means.

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**4,389,635**

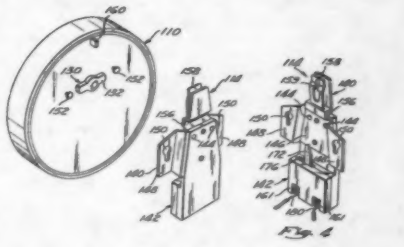
## INTERFACING ATTACHMENT FOR REMOTE MECHANICAL FIRE ALARMS

**Edward L. Gallagher, Dana Point, Calif., assignor to A-T-O, Inc., Willoughby, Ohio**

**Continuation-in-part of Ser. No. 206,003, Nov. 12, 1980, abandoned. This application Nov. 28, 1980, Ser. No. 211,382**

**Int. Cl.³ G08B 25/00, 1/08**

**U.S. Cl. 340—287** **16 Claims**



1. An attachment for converting a single station, mechanical spring-powered temperature sensitive fire alarm protection device into a remote signalling temperature detector for a central fire alarm system without modifying in any way either the internal apparatus of said fire protective device or the environmental protection for said internal apparatus, said attachment comprising:

a permanent magnet for producing a magnetic field;

an electrical switch, in juxtaposition to said magnet, which is activated by applying an external magnetic field to said switch;

a movable shield member of magnetizable material having a first position located between said magnet and said switch to substantially shield the switch from said magnetic field, and a second position, at least partially removed from between said magnet and said switch, to expose said switch to at least a portion of said magnetic field, said portion of said magnetic field activating said switch, and the magnetic force of said field upon said shield tending to retain said shield in said first position;

a lever attached to said movable shield for moving said shield from said first to said second position;

said mechanical fire alarm protection device having (i) an externally accessible winding key which rotates when said fire alarm protection device is actuated, said winding key having at least one protrusion, and (ii) a mounting wall bracket for mounting said device; and

a housing for mounting said magnet, said switch, and said

movable shield as a unitary assembly upon said mounting wall bracket, said lever extending from said unitary assembly so that (i) as said winding key rotates, said protrusion engages said lever to move said shield from said first position to said second position upon actuation of said fire alarm protection device, (ii) the electrical state of said switch is changed by such actuation of the alarm, and (iii) as said winding key continues to rotate said winding key ceases to engage said lever and the magnetic force of said field pulls said shield back to said first position.

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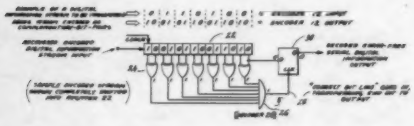
**4,389,636**

## ENCODING/DECODING SYNCRONIZATION TECHNIQUE

**Herbert S. Riddle, Jr., 403 W. Frier Dr., Phoenix, Ariz. 85021**

**Filed Nov. 3, 1980, Ser. No. 203,475**
**Int. Cl.³ H04L *3/00***
**U.S. Cl. 340—347 DD** **13 Claims**



1. An encoding/decoding process for transferring serial digital bits, comprising the steps of:

encoding each bit as a corresponding complementary-bit-pair wherein a predetermined one of the pair corresponds to the original bit and the other is the complement of that bit;

transferring this encoded stream of complementary-bit-pairs to a decoder;

analyzing in said decoder simultaneously a pluralility of adjacent pairs of said encoded stream to determine whether a complementary relationship exists between the adjacent bits of all such pairs; and

directing a predetermined bit of one of said sequential pairs to an output line when all of said currently analyzed adjacent pairs of said encoded stream are determined to have a complementary relationship.

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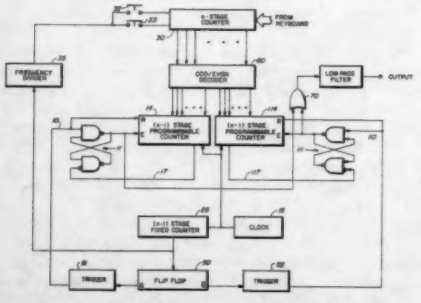
**4,389,637**

## DIGITAL TO ANALOG CONVERTER

**Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corp. of America, Franklin Park, Ill.**

**Division of Ser. No. 118,495, Feb. 4, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,194**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 DA** **3 Claims**



1. A digital to analog converter comprising:

first and second time interval measuring means, each having an input and an output and respectively including therein first and second multi-stage programmable counters, said time interval measuring means each providing a first output state on the output thereof when the interval between input pulses applied to the input thereof is less than a first predetermined amount and providing a second output state on the output thereof whenever the interval between such input pulses is more than a first predetermined amount;

means in each of said first and second time interval measuring means responsive to input pulses applied to the respective inputs thereof for resetting the respective programmable counter therein to a predetermined reset condition;

means for supplying clock pulses coupled with said first and second counters for advancing said counters from initial conditions to output pulse producing conditions in response to a predetermined number of clock pulses, such predetermined number of pulses being the number of pulses necessary to establish said interval of said first predetermined amount;

fixed counter means coupled between said means for supplying clock pulses and the inputs of said first and second time interval measuring means for supplying input pulses at a fixed frequency lower than the frequency of said clock pulses to the inputs of said first and second time interval measuring means, the pulses applied to the input of said first time interval means being 180 degrees out of phase with the input pulses applied to the input of said second time interval measuring means;

a fourth counter, the stages of which are coupled with said first and second programmable counters in a predetermined manner for programing said first and second programmable counters with a digital number to be converted, said number corresponding to the initial conditions, and said fourth counter having at least one input for changing the count therein in response to pulses applied thereto; and

frequency divider means coupled between the output of said fixed counter and the input to said fourth counter to supply pulses to said fourth counter at a predetermined frequency lower than said fixed frequency, whereby the number of clock pulses required to advance said first and second counters from the initial conditions thereof to the output pulse producing condition is proportional to the digital number being converted.

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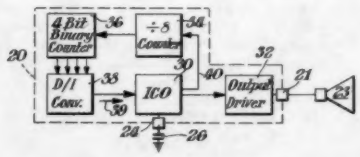
**4,389,638**

## I.C. ALARM SIGNAL GENERATOR

**Walter S. Gontowski, Jr., Thompson, Conn., assignor to Sprague Electric Company, North Adams, Mass.**

**Filed Sep. 30, 1981, Ser. No. 307,057**
**Int. Cl.³ G08B *3/00***
**U.S. Cl. 340—384 E** **5 Claims**




1. A yelping alarm signal generator comprising:

a current controlled oscillator means for periodically charging and discharging a capacitor at a rate that is a function of a control current; and

a frequency-to-current converter means being connected from an output to an input of said oscillator means for producing said control current and for setting the ampli-

tude of said control current at a value that is a function of said rate of periodic charging and discharging.

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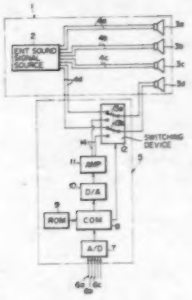
4,389,639

## VOICE WARNING DEVICE USING ENTERTAINMENT SPEAKER

Taketsugu Torii, Kasugai; Hisatoshi Oota, and Hiroshi Arai, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 4, 1980, Ser. No. 204,059
Claims priority, application Japan, Apr. 23, 1980, 55-54804
Int. Cl.³ G08B 25/02; H04M 1/00
U.S. Cl. 340—539 3 Claims




1. A voice warning device for a driver's compartment equipped with an entertainment sound production system comprising a plurality of speakers, an entertainment sound signal production device, and a plurality of electrical connections for conducting entertainment sound-bearing electric signals from the entertainment sound signal production device to said speakers;

said voice warning device, comprising:

a plurality of switching devices, each provided in one of said electrical connections between one of said speakers and said entertainment sound signal production device;

a warning voice sound signal production device, for selectively generating electric signals representing human voice sounds for conveying a warning; and,

means for operating said switching devices such that all of said switching devices are automatically switched to transmit entertainment sound-bearing electric signals from said entertainment sound signal production device to their respective speakers when said warning voice sound signal production device is not generating electric signals, but, when said warning voice sound signal production device is generating electric signals, at least one of said switching devices is automatically switched from transmitting entertainment sound-bearing electric signals from said entertainment sound signal production device to its respective speaker to transmitting warning voice sound-bearing electric signals from said warning voice sound signal production device to said respective speaker;

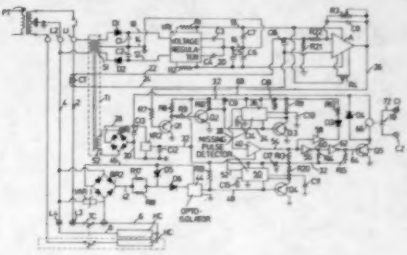
said operating means automatically changing a number of said switching devices which transmit said warning voice sound-bearing electric signal to a respective speaker in accordance with a type of warning voice sound-bearing electric signal which is being produced so that said number is increased as the severity and urgency of the condition represented by the warning voice sound-bearing electric signal increases.

4,389,640

## APPARATUS FOR DETECTING LOSS OF AC POWER SUPPLY AND LOSS OF CURRENT

James E. Dawdy, Cambridge, Canada, assignor to Sutherland-Schultz Limited, Kitchener, Canada

Filed Mar. 31, 1981, Ser. No. 249,537
Claims priority, application Canada, Dec. 8, 1980, 366341
Int. Cl.³ G08B 23/00
U.S. Cl. 340—664 10 Claims



1. Apparatus for detecting loss of AC power supply for an electrical conductor and loss of current through the electrical conductor when the power supply is connected thereto, said apparatus comprising voltage responsive means operable to produce a voltage present signal when the power supply is connected to the electrical conductor and a predetermined voltage is present across the conductor and a voltage absent signal when the predetermined voltage is not present across the conductor, current responsive means operable to produce a current present signal when a predetermined current is flowing through the conductor and a current absent signal when the predetermined current is not flowing through the conductor, fault-signalling means connected to said AC power supply for operation thereby, and means responsive to the simultaneous presence of a voltage present signal and a current present signal and to the simultaneous presence of a voltage absent signal and a current absent signal to cause the power supply to operate the fault-signalling means in a no-fault indicating sense, the absence of said AC power supply or the simultaneous presence of an absent signal and a present signal causing the fault-signalling means to indicate a fault condition.

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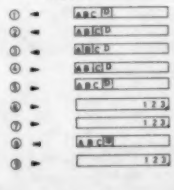
4,389,641

## ALPHANUMERIC DISPLAY

Yasuhiro Nakanishi, and Yoshiyuki Fujikawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1981, Ser. No. 272,694
Claims priority, application Japan, Jun. 13, 1980, 55-80353
Int. Cl.³ G09G 3/36
U.S. Cl. 340—709 2 Claims




1. A display device capable of displaying selectively numerical information or character information on a display panel, said display device comprising:

means for sensing if a specific cursor symbol moving along information now on said display panel upon depression of

a specific key reaches an information display section of a predetermined digit length; and

means for displaying selectively said character information or said numerical information in response to the output of said sensing means.

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**4,389,642**

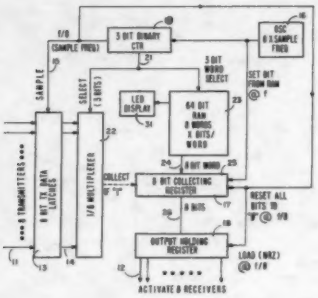
## DIGITAL MATRIX SWITCHING

**William M. Kahn, 600 Pleasant St., Watertown, Mass. 02154**

**Filed Jul. 1, 1981, Ser. No. 279,323**

**Int. Cl.³ H04Q 9/00**

**U.S. Cl. 340—825.03** **8 Claims**




1. Switching apparatus comprising,

a plurality of input ports,

a plurality of output ports,

memory means for storing selection signals representative of selected data signal transfer paths between said input ports and said output ports,

collecting register means for receiving sampled data signals from predetermined ones of said input ports and storing a sequence of bit signals representative thereof,

means for sampling said input ports and transferring sampled data signals from selected ones of said input ports to said collecting register means in response to said selection signals provided by said memory means to store a sequence of bit signals representative of the transferred sampled data signals,

means for initially setting each bit signal in said collecting register means to an initial state at the beginning of a sampling interval,

means responsive to coincidence between a bit signal representative of a data signal then sampled by said means for sequentially sampling and a corresponding bit in a selection signal then provided by said memory means for altering the state of a corresponding bit signal during the sampling interval,

and means for transferring the bit signals stored in said collecting register means to said output ports to thereby transfer signals on selected ones of said input ports to selected ones of said output ports in accordance with the selection signal provided by said memory means.

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**4,389,643**

## MULTIPLEXED PULSE TONE SIGNAL RECEIVING APPARATUS

**Desmond W. Hill, Brentwood Bay, Canada, assignor to Edison Control Corporation, Metuchen, N.J.**

**Filed Oct. 5, 1981, Ser. No. 308,498**

**Int. Cl.³ H04Q 9/10; H03K 5/00**

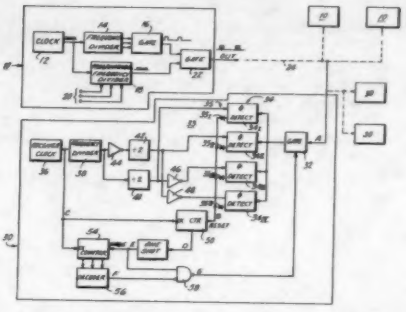
**U.S. Cl. 340—825.48** **12 Claims**

1. Apparatus for receiving predetermined ones of multiplexed pulse tone signals, comprising:

tone detector means having an input for receiving a tone signal and operable to detect a tone signal of predetermined frequency;

input gate means coupled to said input of said tone detector means for supplying multiplexed pulse tone signals thereto;

output means coupled to said tone detector means for producing an output signal when said tone detector means detects a tone signal of said predetermined frequency; and




gate control means responsive to said output signal for periodically actuating said input gate means to assume a transmissive condition so as to pass only predetermined ones of said multiplexed pulse tone signals to said tone detector means.

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**4,389,644**

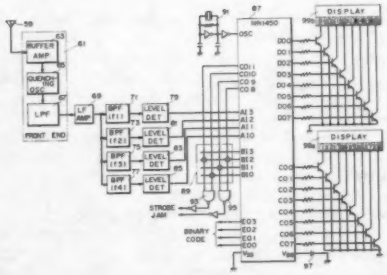
## ASYNCHRONOUS TYPE MULTICHANNEL SIGNAL PROCESSING SYSTEM

**Toshio Abiko, Ibaragi, and Masayuki Matsuo, Shijonawate, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jan. 21, 1981, Ser. No. 226,874**

**Int. Cl.³ H04Q 9/12; H04B 1/00**

**U.S. Cl. 340—825.52** **16 Claims**




1. An asynchronous type multichannel signal processing system comprising:

a transmitter including;

transmission data generating means for generating data being transmitted,

frequency signal generating means for generating a plurality of frequency signals,

converting means responsive to said transmission data and said frequency signals for converting said transmission data into a transmission signal wherein one unit time period corresponding to one portion of said data being transmitted includes any one of said frequency signals and a group of a plurality of unit time periods constitute an information unit, and

transmitting means for transmitting said transmission signal converted by said converting means to said receiver; and

a receiver including;

receiving means for receiving said transmission signal transmitted from said transmitter, and

received data processing means for repetitively reading the received transmission signal obtained from said receiving means at a plurality of different timings during each said unit time period to produce a plurality of data readings; and

means for determining that said received data is correct when said plurality of data readings which coincide are at least two but not greater than the number of said data readings.

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**4,389,645**

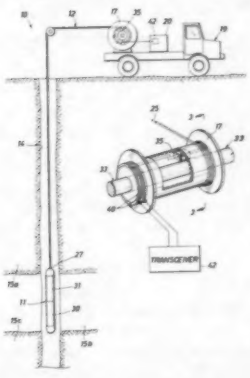
## WELL LOGGING FIBER OPTIC COMMUNICATION SYSTEM

**Russell P. Wharton, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.**

**Filed Sep. 8, 1980, Ser. No. 184,704**

**Int. Cl.³ G01V *1/40***

**U.S. Cl. 340—854** **12 Claims**




1. A well logging system for measuring characteristics of earth formations in a borehole, comprising:

(a) a communication cable having fiber optic means therein for conducting light signals therethrough,

(b) a tool including a sonde connected to one end of said cable,

(c) means in said tool for measuring characteristics of earth formations in the borehole, converting the measurements into modulated light signals, and launching said modulated light signals into said fiber optic means in said cable,

(d) a rotatable winch drum supporting said cable at the upper end of the borehole, and for lowering and raising said cable and tool into and out of the borehole in response to rotation of said winch drum,

(e) transducer means mounted on said drum for rotation therewith and coupled to the end of said cable opposite said tool, for receiving said optical signals and converting them into electrical signals representative of said earth formation measurements,

(f) a receiver mounted outside said drum, and

(g) means for transmitting said electrical signals from said transducer means to said receiver for conveying the information carried by said modulated light signals out of said rotatable winch drum without the use of optical slip rings.

**4,389,646**

## DISPLACEMENT CONVERTING CIRCUIT ARRANGEMENT

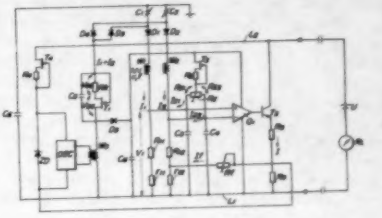
**Keiichiro Tago, Kawasaki, Japan, assignor to Fuji Electric Co. Ltd., Kanagawa, Japan**

**Filed Mar. 31, 1981, Ser. No. 249,351**

**Claims priority, application Japan, Apr. 30, 1980, 55-58128[U]; Apr. 30, 1980, 55-58129[U]**

**Int. Cl.³ G08C *19/10*; G06G *7/20***

**U.S. Cl. 340—870.37** **14 Claims**



1. A displacement converting circuit arrangement comprising:

first and second impedance elements, the impedance of at least one of said elements being variable in response to a mechanical displacement thereof;

means for deriving first and second DC currents, said first and second DC currents being proportional to the impedances of said first and second impedance elements, respectively;

means for deriving a current corresponding to the sum of said first and second DC currents;

a field effect transistor having said current corresponding to the sum of said first and second DC currents flowing between its source and drain electrodes, said field effect transistor maintaining said sum current at a constant value;

means for maintaining at least one of said first and second DC currents at a fixed amount;

a differential amplifier having first and second input terminals and an output terminal, said first and second DC currents being supplied to the first and second input terminals respectively of said differential amplifier; and

an output transistor coupled to the output terminal of said differential amplifier, the current at the output of said output transistor corresponding to the difference between said first and second DC currents, said output current indicating the magnitude of said mechanical displacement.

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**4,389,647**

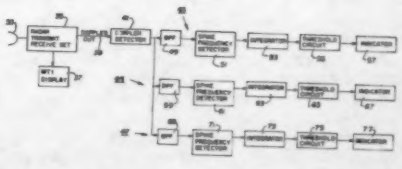
## DOPPLER DISCRIMINATION OF AIRCRAFT TARGETS

**Michael A. Fanuele, Toms River; Joseph A. McCray, Freehold, and Otto F. Rittenbach, Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 22, 1980, Ser. No. 219,455**

**Int. Cl.³ G01S *13/52, 13/00***

**U.S. Cl. 343—7.7** **2 Claims**



1. A Doppler radar capable of discriminating between different types of aircraft having rotating elements including cir-

cuitry for sensing the occurrence of increases in the Doppler signal amplitude of target returns resulting from increases in cross section of the rotating elements as they become orthogonal to the incident radar beam of said radar, said circuitry comprising, Doppler detector means for detecting the Doppler signal of said radar including a direct reference voltage indicative of the body of said aircraft and a spike frequency component indicative of the orthogonal rotating element of a particular aircraft type, bandpass filter means coupled to the Doppler detector, said bandpass filter means having a wide passband that blocks the direct voltage and passes the spike frequency component, a threshold circuit and a pulse stretcher connected in cascade to the output of said bandpass filter, said threshold circuit providing an output pulse upon the occurrence of said spike frequency above a set threshold, a microprocessor adapted to receive the output of said pulse stretcher, a clock connected to said microprocessor, and a plurality of indicators connected to the output of said microprocessor, each indicator being associated with a respective aircraft type, said microprocessor being adapted to count the number of stretched pulses occurring in a predetermined time period determined by the frequency of said clock and to operate an indicator if the frequency of said stretched pulses corresponds closely to the rotating element spike frequency of an aircraft represented by that indicator.

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## DOPPLER RADAR SYSTEM

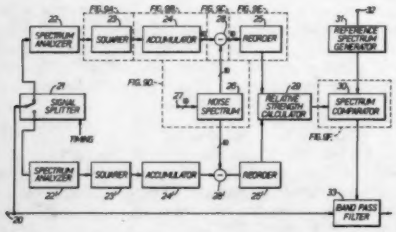
**Anthony P. Luscombe, Chelmsford, and Seville R. Brooks, Ongar, both of England, assignors to The Marconi Company Limited, Chelmsford, England**

**Filed Jul. 30, 1980, Ser. No. 173,912**

**Claims priority, application United Kingdom, Jul. 31, 1979, 7926636**

**Int. Cl.³ G01S *13/60***

**U.S. Cl. 343—8** **10 Claims**




1. A Doppler radar system including an antenna having a main lobe whose aspect is fixed relative to the radar system; means for separating a signal received by the antenna into at least two signal parts reflected at different times from respective different regions defined by said main lobe, said different regions having a common range of target positions; means for analyzing each signal part into components having different Doppler shifts; means for calculating for each said position, a value constituting a measure of the relative strengths of those components of the two signal parts which are derived from reflections off that position; and selecting means for using the calculated values to determine the frequency components of the received signal derived from reflections in a particular direction or range of directions within the said main lobe.

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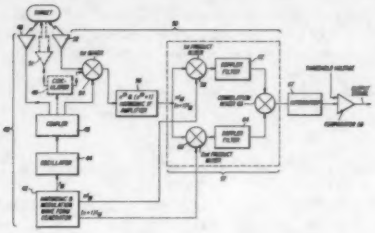
## DUAL CHANNEL CORRELATOR FOR AN FM-CW RANGING RADAR

**Ross A. Parkhurst, Bethesda; David L. Rodkey, Kensington, and John O. Wedel, Ellicott City, all of Md., assignors to The United States Army as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 14, 1980, Ser. No. 196,409**

**Int. Cl.³ G01S *13/02***

**U.S. Cl. 343—17.5** **16 Claims**



1. A method of eliminating the sidelobe ambiguity in the range response of an FM-CW radar comprising the steps of:

transmitting a periodic FM-CW signal with a selected periodic frequency;

receiving a reflected signal which comprises a reflected portion of the transmitted signal;

combining the reflected signal with a first reference signal to obtain a first combination signal;

amplifyng a selected portion of the first combination signal;

combining the amplified selected portion of the first combination signal with second and third reference signals to obtain second and third combination signals; and

combining the second combination signal with the third combination signal to obtain a fourth combination signal with a main lobe of one polarity and sidelobes of an opposite polarity.

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**4,389,650**

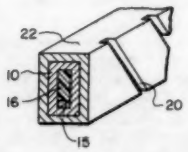
## LINE SOURCE ANTENNA FOR ELECTRONIC BEAM SCANNING

**Richard A. Stern, Allenwood, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Nov. 10, 1980, Ser. No. 205,361**

**Int. Cl.³ H01Q *13/10***

**U.S. Cl. 343—768** **13 Claims**




1. In a line source microwave antenna coupled to a source of RF energy and adapted to provide electronic beam scanning in a plane including the line source by means of an electronic driver circuit, the improvement comprising:

a longitudinal section of rectangular waveguide microwave transmission line having broad and narrow side walls enclosing a central area and including a lengthwise array of radiation means periodically located in one side wall of said waveguide section;

a hollow rectangular monolithic ferrite phase shifter located within said waveguide section extending continuously for

the length of all of said radiation means of said array and including phase shifter control means coupled to said driver circuit for controlling the operative state of said ferrite phase shifter in response to output signals from said driver circuit and thereby effect scanning a beam of RF energy radiated from said array of radiation means; and

said waveguide section having internal transverse cross-sectional height and width dimensions of said central area fitting closely about and substantially equal to the external transverse cross-sectional height and width dimensions of said ferrite phase shifter.

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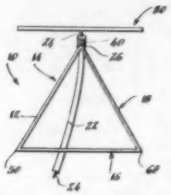
**4,389,651**

## TRIANGULAR ANTENNA

**Philip P. Tomasky, 73 Warner Hill Rd., Southport, Conn. 06490**

**Filed May 4, 1981, Ser. No. 260,373**
**Int. Cl.³ H01Q 9/28**
**U.S. Cl. 343—794** **11 Claims**



1. A broadband radio frequency antenna comprising:

an electrically conductive triangle-shaped first frame member;

a radiator rod electrically insulated from said frame member and situated adjacent and perpendicular to the bisector of one corner of said frame member; and

connector means for electrically connecting an antenna cable to said radiator member and said frame member.

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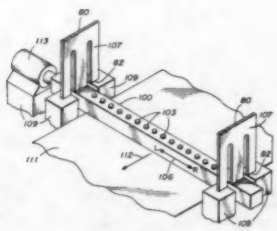
## BIDIRECTIONAL INK JET PRINTING

**Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 22, 1981, Ser. No. 304,491**
**Int. Cl.³ G01D 15/18**
**U.S. Cl. 346—1.1** **1 Claim**



1. A method of operating a drop-on-demand ink jet ejector, which comprises:

(a) providing an ink jet ejector on a support member,

(b) oscillating said support member,

(c) moving a record-receiving member in a direction perpendicular to the direction of oscillation of said support member,

(d) providing deflection electrodes on said support member on each side of said ink ejector in a direction parallel to the direction of oscillation of said support member,

(e) ejecting droplets from said ejector, and

(f) electrostatically deflecting droplets ejected from said ejector an amount sufficient to ensure that any two contiguous droplets are spaced from each other a distance in the direction parallel to the direction of oscillation of said support member that does not vary regardless of the support member position.

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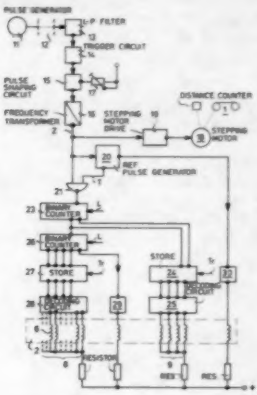
## LINE RECORDING DEVICE

**Manfred Fichter, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany**

**Filed May 14, 1981, Ser. No. 263,564**
**Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018744**
**Int. Cl.³ G01D 9/00, 15/08**
**U.S. Cl. 346—49** **6 Claims**



3. A recording device for measuring variable values and recording them on a record carrier, comprising:

moving means for moving the record along a given direction, a plurality of recording means for defining separate tracks along the direction when the record carrier moves and for tracing lines along the tracks when actuated;

said plurality of recording means forming a first group and a second group, measuring means coupled to said recording means for measuring the variable value;

energizing means for energizing a different recording means of the first group for each one of a number of a ranges of measured values and for energizing a different recording means of the second group for each one of a number of increments of measured values within each range, each recording means of the second group being energized for the corresponding increment t within each range.

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## INK JET DROPLET GENERATOR FABRICATION METHOD

**Ari Bar-on, Rochester, and John R. Debesis, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 1, 1981, Ser. No. 307,393**
**Int. Cl.³ G01D 15/18**
**U.S. Cl. 346—75** **8 Claims**

1. A method for fabricating an ink jet drop generator comprising the steps of:

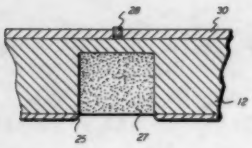
forming a metallic body having an ink cavity therein and a substantially planar nozzle surface;

extending the cavity into said body to within a specified distance of planar nozzle surface at at least one location;

applying a dielectric material to the region of the planar

nozzle surface in alignment with the location at the cavity extension;

electroforming a nozzle plate by adherently plating a metallic layer to other regions of said planar surface not covered by dielectric material; and




etching said metallic body in the region between the cavity extension and the planar surface to create passage-way between the cavity and the planar surface.

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## OPTICAL DEVICE FOR NON-CONTACT RECORDING AND PARTICULAR FACSIMILE REPRODUCTION OF IMAGES AND TEST

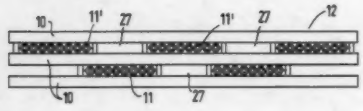
**Peter Baues, Krailling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Sep. 4, 1980, Ser. No. 184,002**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938301**

**Int. Cl.³ G01D *9/42***

**U.S. Cl. 346—107 R** **19 Claims**




2. In an optical display device for non-contact recording information on a recording surface and in particular for use in facsimile reproduction of images and text, said device having a cylindrical recording carrier, a recording head having a plurality of light waveguides in the form of glass fibers having exit ends and entrance ends, said recording head being fixedly mounted with the exit ends facing the cylindrical carrier surface and extending linearly with a dense packing adjacent one another, said entrance end of each of the fibers being in communication with a light source for receiving modulated light to transmit along the fiber to the exit end the improvements comprising the recording head being a multi-recording head of individual sub-recording heads, said individual sub-recording heads being arranged in at least two rows separated from one another by a support member of synthetic material, adjacent individual sub-recording heads in each row being spaced from each other by spacing members with the sub-recording heads of one row overlying the spacing members of the other row and being offset from the sub-recording heads of said other row, each of said sub-recording heads including at least one adjustment plate having a plurality of individual grooves extending inward from one edge surface of the plate with one groove being provided for each of the waveguides, said waveguide being secured in said grooves with the exit ends being adjacent said one edge surface and being oriented in a line extending parallel to the axis of the cylindrical carrier in a fixed true-to-size relationship, and each of said sub-recording heads including a light source member secured thereon, said light source member having the individual light sources for each of the waveguides and means enabling individual exciting of each of the light sources in accordance with the image information to be produced, said individual light sources being arranged at a spacing corresponding to the spacing of the entrance ends of said waveguide so that when secured to the recording head, the individual light sources are aligned with the respective entrance ends of the fibers.

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## MULTIPLE ELECTRODE SYSTEM

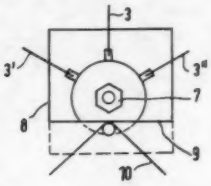
**Stephan Heilstab, March-Holzhausen, Fed. Rep. of Germany, assignor to Hugo Sachs Elektronik KG, Fed. Rep. of Germany**

**Filed Apr. 10, 1981, Ser. No. 252,734**

**Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013773**

**Int. Cl.³ G01D *15/08***

**U.S. Cl. 346—139 C** **13 Claims**




1. A multiple electrode apparatus comprising a stack of alternately arranged electrically insulating plates and electrically conductive plates, the insulating plates being in the form of substantially identical discs as are the conductive plates, each disc having a bore and being mounted on an electrically insulating mounting member, the discs being pressed together on the member by end pressure plates, and said stack being cast in a block of synthetic resin having one side surface-ground up to the conductive discs.

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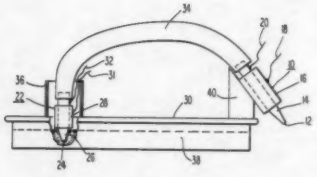
## INK JET SYSTEM

**James McMahon, New Milford, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.**

**Filed Nov. 3, 1980, Ser. No. 203,590**

**Int. Cl.³ G01D *15/16***

**U.S. Cl. 346—140 R** **12 Claims**




1. An ink jet system comprising:

an ink jet including an ink chamber, a jet orifice and a jet electromechanical transducer coupled to said chamber for projecting droplets from said orifice as the volume of said chamber changes in response to the state of energization of said transducer;

an ink supply;

a pump coupled to said jet and adapted to communicate with said ink supply, said pump comprising a pump electromechanical transducer and a pump chamber including an orifice for receiving ink through said orifice, said pump chamber being coupled to said pump transducer so as to change the volume of said pump chamber as the state of energization of said pump transducer changes thereby pumping ink toward said jet wherein said pump orifice is

characterized by substantially the same maximum cross-sectional dimension of said orifice; and

an ink reservoir for containing said supply of ink, said pump orifice being immersed in said supply within said reservoir.

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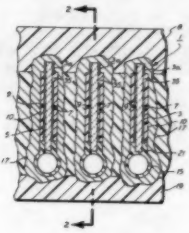
**INK JET ARRAY**

**Theodore P. Perna, Garland; Curt R. Raschke, Dallas, and William L. Baker, Jr., Lewisville, all of Tex., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 31, 1982, Ser. No. 364,066**

**Int. Cl.³ G01D *15/18***

**U.S. Cl. 346—140 R** **1 Claim**



1. A fluid impulse jet in which a rectangular transducer is arranged abaxially to a fluid channel wherein said fluid channel is formed in a relatively rigid material, and the drive pulse from said transducer is transmitted through said relatively rigid material to said fluid channel.

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**4,389,659**

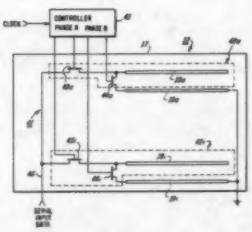
**ELECTRO-OPTIC LINE PRINTER**

**Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 17, 1980, Ser. No. 187,911**

**Int. Cl.³ G01D *15/00, 9/46;* G02F *1/01***

**U.S. Cl. 346—153.1** **20 Claims**



1. In an electro-optic line printer having

a multi-gate light valve for p-modulating a sheet-like, collimated light beam in accordance with input data samples of finite duration representing individual picture elements of an image, and

p-sensitive optics for imaging the modulated light beam onto a photosensitive recording medium which advances in a cross line direction relative to said light valve, whereby said recording medium is exposed in an image configuration;

said light valve including

an optically transmissive electro-optic element having a predetermined optical axis, and

a plurality of individually addressable electrodes intimately coupled to said electro-optic element, said electrodes being spaced apart orthogonally relative to said optical axis;

the improvement comprising

respective sample and hold circuits coupled to said electrodes for maintaining the data samples for each line of said image on said electrodes for period of time longer than the duration of any of said data samples, thereby increasing the exposure of said recording medium;

said sample and hold circuits including capacitive storage means;

said capacitive storage means being defined in substantial part by distributed capacitance between said electrodes and said electro-optic element.

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**4,389,660**

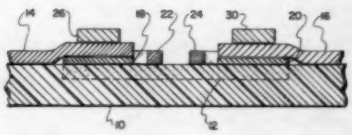
**HIGH POWER SOLID STATE SWITCH**

**D. Richard Decker, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jul. 31, 1980, Ser. No. 174,053**

**Int. Cl.³ H01L *29/48, 29/80, 27/02***

**U.S. Cl. 357—22** **10 Claims**



1. An integrated dual gate switch fabricated on a semi-insulating substrate, comprising:

a region of one conductivity type in said substrate;

an input line on said substrate and coupled to said region by a first ohmic contact;

an output line on said substrate spaced from said input line and coupled to said region by a second ohmic contact;

a first gate on said substrate between said input line and said output line;

a second gate on said substrate between said first gate and said output line, said first and second gates being biassed in the on state of said switch at no less than 0 Volts with respect to said input and output lines;

a first capacitive coupling between said input line and said first gate, including:

a first conductor on said substrate and overlapping a portion of said input line and a portion of said first gate; and

a first dielectric layer between said first gate and said first conductor; and

a second capacitive coupling between said output line and said second gate, including:

a second conductor on said substrate and overlapping a portion of said output line and a portion of said second gate; and

a second dielectric layer between said second gate and said second conductor,

whereby any AC voltage appearing across said switch in the off state will be coupled to said first and second gates by said first and second capacitive couplings to maintain said switch in the off state.

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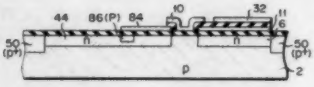
## SOLID STATE IMAGE-SENSING DEVICE CAPABLE OF SHIFTING SIGNAL CHARGES TO A CHARGED TRANSFER REGION AT A HIGH SPEED

Tetsuo Yamada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 23, 1981, Ser. No. 227,935
Claims priority, application Japan, Jan. 25, 1980, 55-6990
Int. Cl.³ H01L 29/78; G11C 19/28
U.S. Cl. 357—24 4 Claims




1. A solid state image-sensing device which comprises:
a semiconductor substrate of one conductivity type;
a photoelectric conversion section including at least one semiconductor region having the opposite conductivity type as that of the semiconductor substrate and formed in the surface area of said semiconductor substrate;
a charge transfer section formed apart from the photoelectric conversion section;
a charge-storing section formed spatially between said photoelectric conversion section and said charge transfer section, and including a second semiconductor region integrally formed with the first semiconductor region of said photoelectric conversion section and having the opposite conductivity type as that of said semiconductor substrate, and a first electrode insulatively formed on said second semiconductor region;
a charge-shifting section provided between said photoelectric conversion section and said charge-storing section to shift charges generated in said photoelectric conversion section to said charge-storing section, and including a third semiconductor region formed in said second semiconductor region in a position adjacent to said first semiconductor region and having the same conductivity type as said semiconductor substrate, and a second electrode insulatively formed on said third semiconductor region and in electrical connection with said first electrode; and
a charge-shift control section disposed between said charge-storing section and said charge transfer section to control the operation of shifting charges from said charge-storing section to said charge transfer section.

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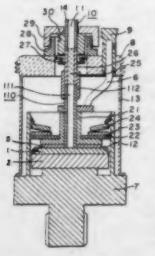
4,389,662

## LIGHT-ACTIVATED SEMICONDUCTOR DEVICE

Tatsuo Miyajima, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,104
Claims priority, application Japan, Aug. 28, 1979, 54-110080
Int. Cl.³ H01L 27/14, 23/42
U.S. Cl. 357—30 5 Claims




1. In a light activated semiconductor device comprising a semiconductor element activated by an optical signal; at least two main electrodes, mutually insulated for passing current from the activated semiconductor element; a casing comprising said main electrodes and hermetically sealing the semiconductor element; and a light cable passing through the casing by means of a light transmitting passage so as to transmit the optical signal to the semiconductor element, an improvement comprising:
a hermetically formed light transmitting glass optically connected to said light cable, said glass being hermetically held by and contacting a flexible flange fixed to a part of the casing containing said light transmitting glass; and
pressure means inside said casing for press-contacting said semiconductor element with said main electrodes.

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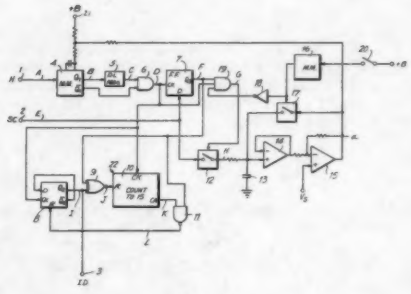
4,389,663

## APPARATUS FOR INDICATING THE PHASE OF THE COLOR SUBCARRIER SIGNAL IN EACH LINE OF A COLOR TELEVISION SIGNAL

Mitsushige Tatami, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,260
Claims priority, application Japan, Jun. 26, 1980, 55-87140
Int. Cl.³ H04N 9/46, 5/76
U.S. Cl. 358—19 16 Claims




1. Apparatus for indicating whether the phase of the color subcarrier signal of a color television signal is positive or negative, comprising: phase detecting means for detecting the phase of the color subcarrier signal which is present at a predetermined time following the occurrence of the horizontal synchronizing signal of said color television signal and for producing a phase indicating signal; and automatic phase adjustment means for sensing relative phase shifts between said horizontal synchronizing signal and said color subcarrier signal and for adjusting the actual time at which the phase of said color subcarrier signal is detected in accordance with sensed relative phase shifts.

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4,389,664

## SYSTEM AND METHOD TO DERIVE A DIGITAL VIDEO CONTROL SIGNAL

Herbert Robitzsch, Erzhausen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,730
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027054
Int. Cl.³ H04N 9/535
U.S. Cl. 358—22 17 Claims

1. Method of deriving a digital control signal of video frequency from a digital video signal (Y; U, V) comprising the steps of
selecting a desired key color;
deriving a first multiplying factor (m) corresponding to the

slope of the portion of the angle that determines desired passage through null of the key color;

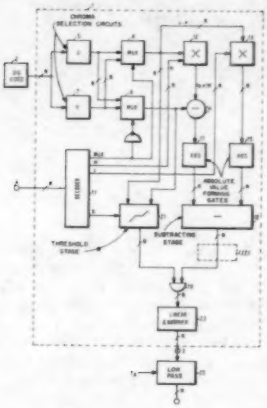
wherein the desired key color is represented by an angle $\phi$ in the color plate of chroma components (U, V);

alternately multiplying the digitized respective types of chroma signal components (U, V) with said first factor to obtain a first multiplied respective chroma signal component (u-m; v-m);

subtracting the multiplied chroma signal component of the first type (u-m) from the chroma signal component of the other type (then v) to provide a subtraction signal (v−u-m; u−v-m);

forming an absolute value of said subtracted signal (|v−u-m|; |u−v-m|);

selecting an angle window, or band of the chroma signal sector;



deriving a second multiplying factor (c) corresponding to the selected angle window or band of the chroma signal component, or sector;

alternately multiplying the digitized respective types of the chroma signal components, in phase synchronism with said first multiplying step, with said second factor to obtain a second multiplied chroma signal component (u-c; v-c);

forming an absolute value of said multiplied second chroma signal components (|u-c|; |v-c|);

comparing said absolute values

$|v-u\text{-}m| \geqq |u\text{-}c|$; $|u-vm| \geqq |uv\text{-}c|$

and deriving a comparison signal;

providing a minimum chroma saturation signal (b) representative of a minimum chroma saturation level;

and furnishing said digital control signal if said comparison signal has a positive value and is at least equal to the minimum chroma saturation level signal (b).

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**4,389,665**

## COLOR DEMODULATION DEVICE FOR USE IN COLOR TELEVISION RECEIVERS

**Nobuya Nagao, and Teturou Sakai, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Sep. 22, 1981, Ser. No. 304,591**

**Claims priority, application Japan, Sep. 30, 1980, 55-135198**

**Int. Cl.³ H04N 9/50**

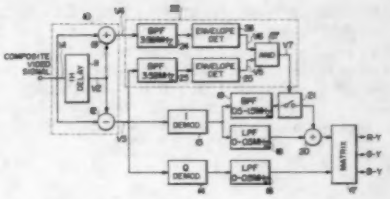
**U.S. Cl. 358—23** **6 Claims**

1. A color demodulation device for demodulating carrier chrominance signal in a composite video signal, said composite video signal having luminance signal component and carrier chrominance signal component multiplexed in frequency-interleaved relation with the luminance signal component, said chrominance signal component being formed by quadrature modulation (carrier-suppressed AM) of a color subcarrier with an I signal and a Q signal, said I signal having a frequency band wider than the Q signal, comprising:

signal separation circuit means using a comb filter for separating the composite video signal into the luminance and carrier chrominance signal components, said luminance and chrominance signal components being extracted from first and second outputs of said signal separation circuit means, respectively;

line correlation detecting means coupled to said first and second outputs of said signal separation circuit means for detecting the correlation between video signals on adjacent horizontal scanning lines;

I signal demodulation circuit means coupled with said second output of said signal separation circuit means for demodulating the I signal;



Q signal demodulation circuit means coupled with said second output of said signal separation circuit means for demodulating the Q signal; and

matrix circuit coupled to said I and Q signal demodulation circuit means,

said I signal demodulation circuit means being responsive to said line correlation detecting means to perform wideband demodulation of the I signal so that the I signal is applied in a wide frequency band to said matrix circuit means where there exists line correlation, and to perform narrowband demodulation of the I signal so that the I signal is applied to said matrix circuit means in a narrow frequency band where there exists no line correlation.

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**4,389,666**

## COLOR TELEVISION CAMERA SYSTEM

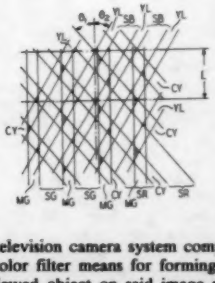
**Hiromichi Kurokawa, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Mar. 17, 1981, Ser. No. 244,722**

**Claims priority, application Japan, Mar. 31, 1980, 55-41333**

**Int. Cl.³ H04N 9/07**

**U.S. Cl. 358—47** **8 Claims**



1. A color television camera system comprising an image pickup tube, color filter means for forming color separated images of a viewed object on said image pickup tube, and means for deriving composite color video signals from said image pickup tube representative of said color separated images, said color filter means having a first set of parallel color stripes for generating a first chrominance signal component

having a first frequency band and having in-phase carrier with respect to every horizontal scanning, a second set of parallel color stripes and a third set of parallel color stripes for generating second and third chrominance signal components having frequency bands on both sides of said first frequency band, respectively with each carrier phase of said second and third chrominance signal components being reversed with respect to every horizontal scanning, wherein said first set of color stripes are oriented vertically and said second and third set of stripes are angularly displaced relative to each other and relative to said first set of color stripes and wherein the ratio of the width t to pitch T for each of said first, second and third set of color stripes is greater than 0.25 and less than 0.5.

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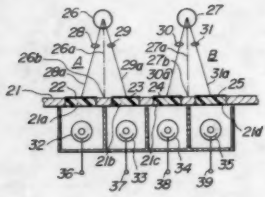
**4,389,667**

## FLYING SPOT SCANNER FOR USE IN A COLOR PRINTING PROCESS SIMULATING APPARATUS

**Satoru Horiguchi, Iruma, and Takeshi Sasaoka, Kawasaki City, both of Japan, assignors to Dai Nippon Printing Co. Ltd. and Ikegami Tsushinki Co. Ltd., both of Tokyo, Japan**

**Filed Mar. 3, 1981, Ser. No. 240,068**
**Claims priority, application Japan, Mar. 10, 1980, 55-29893**
**Int. Cl.³ H04N *1/10, 5/84***
**U.S. Cl. 358—75** **4 Claims**




1. In combination with an apparatus for simulating a color printing process, a flying spot scanner for scanning a set of first, second, third and fourth color separation films formed from a color original, the color original being displayed on a color monitor by processing primary color signals derived by scanning said set of color separation films, said flying spot scanner comprising

a film setting stage having first, second, third and fourth transparent sections on which said first, second, third and fourth color separation films are placed, respectively;

a first optical scanning system arranged above said first and second transparent sections for optically scanning said first and second color separation films placed on said first and second transparent sections, respectively, said first optical scanning system comprising a first cathode ray tube for producing a first scanning raster on its screen and having an optical axis which intersects perpendicularly the film setting stage at the midpoint of said first and second color separation films, and first and second lens systems arranged on lines extending from the center of the screen of said first cathode ray tube and the centers of said first and second color separation films, respectively, for projecting images of said first scanning raster on said first and second color separation films, respectively; and

a second optical scanning system arranged above said third and fourth transparent sections for optically scanning said third and fourth color separation films placed on said third and fourth transparent sections, said second optical scanning system comprising a second cathode ray tube for producing a second scanning raster on its screen and having an optical axis which intersects perpendicularly the film setting stage at the midpoint of said third and fourth color separation films, and third and fourth lens systems arranged on lines extending from the center of the screen of said second cathode ray tube and the centers of said third and fourth color separation films, respectively, for projecting images of said second scanning raster on said third and fourth color separation films, respectively.

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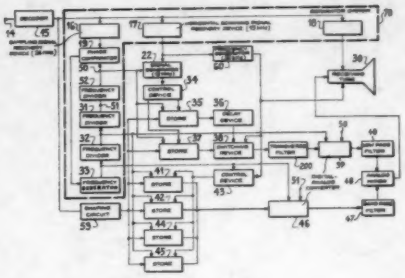
**4,389,668**

## HIGH DEFINITION TELEVISION SYSTEM

**Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jun. 24, 1981, Ser. No. 276,998**
**Claims priority, application France, Jun. 27, 1980, 80 14352**
**Int. Cl.³ H04N *3/34, 5/02***
**U.S. Cl. 358—83** **5 Claims**



1. A high definition television system comprising on transmission a camera incorporating a camera or pickup tube having an input supplying a video frequency signal and a first signal generator for generating scanning signals 1H and 1V necessary for the operation of the camera or pickup tube, said signals 1H and 1V producing an "oscillatory" scan having a line frequency $F_L$ and a ripple frequency F, and on reception a picture restoration device incorporating a signal input, a receiving tube having an input, a second signal generator for generating scanning signals 2H and V necessary for the operation of the receiving tube, said signals 2H and V producing a "linear" restoration having a line frequency $2F_L$, a first processing channel having an input coupled to the input of the picture restoration device and an output for supplying a first signal corresponding to the low part of the spectrum of the input signal of the receiving tube, a second processing channel having an input coupled to the input of the picture restoration device and an output for supplying a second signal corresponding to the upper part of the spectrum of the input signal of the receiving tube, and an analog mixer having first and second inputs respectively coupled to the output of the first processing channel and to the output of the second processing channal and an output coupled to the input of the receiving tube.

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**4,389,669**

## OPTO-VIDEO INSPECTION SYSTEM

**Daniel Epstein, Oceanside, and Robert Lieberman, Bethpage, both of N.Y., assignors to ILC Data Device Corporation, Bohemia, N.Y.**

**Filed Feb. 27, 1981, Ser. No. 238,831**
**Int. Cl.³ H04N *7/18***
**U.S. Cl. 358—101** **30 Claims**

1. Inspection apparatus for inspecting a plurality of target sites on miniaturized devices comprising:

XY table means having a mounting surface provided with plural mounting means;

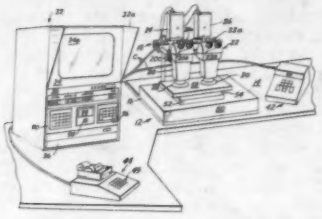
positioning means coupled to said XY table means for moving said mounting surface in mutually perpendicular directions;

optical viewing means positioned above said mounting surface for enabling an operator to view the site on the surface of said table means beneath said optical viewing means;

plural holding means each being removably receivable on

one of said mounting means for accurately positioning at least one of said miniaturized devices upon said mounting surface;

microprocessor means coupled to said positioning means for positioning selected portions of said miniaturized devices in a sequential fashion beneath said optical viewing means



in a predetermined sequence in accordance with a program stored in said microprocessor means; and

video display means coupled to said optical viewing for displaying the site presented by said optical viewing means enabling an operator to view the site under inspection through either the optical viewing means or the video display means.

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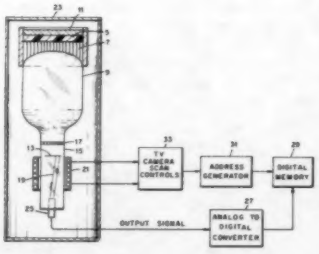
**4,389,670**

## ELECTRONIC METHOD FOR AUTOFLUOROGRAPHY OF MACROMOLECULES ON TWO-D MATRICES

**Jackson B. Davidson, and Arthur L. Case, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Dec. 30, 1981, Ser. No. 335,998**
**Int. Cl.³ H04N 7/18**
**U.S. Cl. 358—111** **9 Claims**




1. An autofluorographic method of detecting and quantifying labeled macromolecules resolved in a matrix in which light spots are produced which correspond to the location and quantity of said macromolecules in said matrix, including the steps of:

exposing said matrix to a television camera system having a lensless, intensified, light sensitive target means on which an electric charge image is accumulated corresponding to said light patterns of said matrix;

scanning said target in a raster with an electron beam to remove the accumulated charge image from said target, and

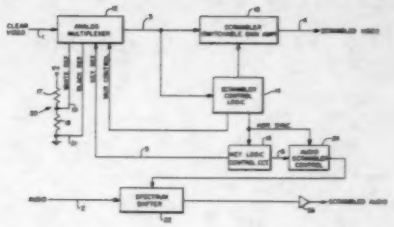
producing output signals indicative of the location and quantity of the electric charge removed from said charge image on said target.

**4,389,671**

## DIGITALLY-CONTROLLED ANALOG ENCRYPTON

**Ronald S. Posner, Indian Harbor Beach; Charles R. Burr, Jr., Palm Bay, and David K. Campbell, Melbourne Beach, all of Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Filed Sep. 29, 1980, Ser. No. 191,844**
**Int. Cl.³ H04N 7/16**
**U.S. Cl. 358—124** **11 Claims**




1. An apparatus for scrambling a television signal comprising

controllable means connected to receive said television signal for selectively inverting the polarity of the signals applied thereto;

scrambler control logic means responsive to synchronizing pulses in said television signal for operating said controllable means to invert the polarity of those portions of said television signal representing randomly-selected horizontal lines of a television picture, including a pseudorandom noise generator providing an output signal applied to said controllable means for selecting the horizontal lines to be inverted;

means for compensating for differential non-linearities introduced into said television signal due to gain variations and level shifting caused by the selective inversion of the polarity of said horizontal lines of a television picture by said controllable means and said scrambler control logic means, said compensating means including signal generating means for generating a calibration signal representing block and white reference levels for said television signal; and

analog multiplexer means for inserting said calibration signal into a horizontal line portion of said television signal, which forms part of the vertical retrace interval thereof, for use in adjusting both the throughput gain and said throughput offset of the television signal at a receiving station, and further including

key logic control means responsive to synchronizing pulses in said television signal for generating key code signals to control said pseudorandom noise generator, said analog multiplexer means being connected to said key logic control means for inserting said key code signals into a horizontal line portion of said television signal, which forms part of the vertical retrace interval thereof, and

wherein the output of said analog multiplexer is applied to said controllable means for scrambling, and said scrambler control logic means includes key detector means connected to the output of said analog multiplexer for setting the state of said pseudorandom noise generator to correspond to a sequence designated by said key code signals upon detection of said signals, and

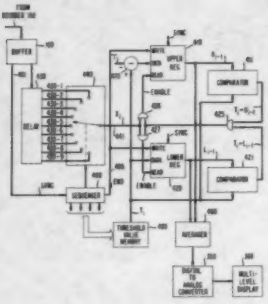
wherein said key logic control means includes a shift register, code selector means for applying said key code signals to said shift register, and key generation control means including a second pseudorandom noise generator responsive to synchronizing pulses in said television signal for randomly shifting the contents of said shift register out to said analog multiplexer means.

**4,389,672**

## DISPLAY OF PSEUDO-GRAY SCALE PICTURE SIGNALS ON MULTILEVEL DISPLAYS

**Edward G. Bowen, Laurence Harbor, and Arun N. Netravali, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Feb. 2, 1981, Ser. No. 230,458**
**Int. Cl.³ H04N 7/12**
**U.S. Cl. 358—160** **23 Claims**



1. Apparatus for estimating the intensity values of picture elements (pels) in a picture processed by comparing said intensity values of said pels with respective threshold values of said picture elements so as to form a pseudo-gray level signal, comprising:

means for providing an indication of the threshold values corresponding to said picture elements, and

means jointly responsive to said threshold value indications and said pseudo-gray level signal for forming said intensity value estimates.

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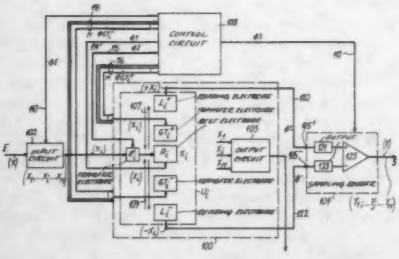
**4,389,673**

## HADAMARD TRANSFORMER USING CHARGE TRANSFER DEVICES

**Claude Despois, 27, rue Pasteur Bat. B, Appt. 208, and Jean-Claude Rebourg, 95, Avenue de la Clairiere, both of 78120 Rambouillet, France**

**Filed Mar. 9, 1981, Ser. No. 242,120**
**Claims priority, application France, Mar. 11, 1980, 80 05406**
**Int. Cl.³ H04N 5/14; G06G 7/12**
**U.S. Cl. 358—160** **14 Claims**



1. A Hadamard transformer which makes a group of N transformed samples $Y_1 \ldots Y_j \ldots Y_N$ correspond to a group of given samples $X_1 \ldots Xi \ldots X_N$, each having transformed samples being defined by a weighted sum of N given samples, the weighting coefficients being equal to +1 and −1, wherein it comprises:

(A) a charge transfer device incorporating:

(a) N rest electrodes $R_1 \ldots R_i \ldots R_N$ preceded by N transfer electrodes $R_1' \ldots R_i' \ldots R_N'$

(b) 2N reading electrodes, which rest electrodes $R_i$ being positioned between a first reading electrode $L_i^+$ and a second reading electrode $L_i^-$;

(c) 2N transfer electrodes $GT_i^+$ and $GT_i^-$ positioned between each rest electrode $R_i$ and the associated reading electrodes $L_i^+$ and $L_i^-$;

(B) an input circuit able to convert the samples $X_1 \ldots X_i \ldots X_N$ into proportional charge groups;

(C) a means for injecting these charge groups beneath the rest electrodes in such a way that the charges corresponding to the samples $X_1 \ldots X_i \ldots X_N$ are respectively positioned beneath the electrodes $R_1 \ldots R_i \ldots R_N$;

(D) a differential charge reader with two inputs, one positive and the other negative, the reading electrode $L_i^+$ being connected to the positive input and the reading electrode $L_i^-$ to the negative input and to an output supplying the transformed samples $Y_1 \ldots Y_j \ldots Y_N$;

(E) a control circuit having a first output connection connected to the rest electrodes $R_i$ and carrying a signal $\phi_1$ and a second output connection connected to the transfer electrodes $R_i$ and carrying a signal $\phi_2$ in phase opposition to $\phi_1$, a first group of N output connections connected to the N transfer electrodes $GT_i^+$ and carrying signals $\phi GT_i^+$ and a second group of N output connections connected to the N transfer electrode $GT_i^-$ and carrying signals $\phi GT_i^-$, said signals $\phi_1$, $\phi_2$, $\phi GT_i^+$ and $\phi GT_i^-$ being able to firstly control the transfer of charges positioned beneath each rest electrode to one of the two associated reading electrodes, then the return of these charges to said rest electrodes, this taking place N times to obtain the N transformed samples.

14. A Hadamard transformer according to claim 1, wherein it is integrated into a picture analyser of the charge transfer type, the input circuit of the transformer being eliminated, its input being directly connected to the output of the picture analyser.

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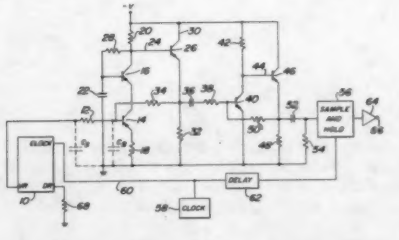
**4,389,674**

## PREAMPLIFIER FOR LOW VOLTAGE SIGNALS IN THE PRESENCE OF HIGH VOLTAGE NOISE

**James J. Hitt, Willow Grove, and Scott L. Kern, Perkasie, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.**

**Filed Mar. 5, 1981, Ser. No. 240,660**
**Int. Cl.³ H04N 3/14; H03K 5/159**
**U.S. Cl. 358—213** **7 Claims**



1. An improved illumination detecting image sensing device comprising:

a source of clock pulses;

a solid state line scanner having a plurality of photodiodes, a clock pulse input connected to said source of clock pulses for scanning said photodiodes to produce a series of switched signals representative of the illumination level of said photodiodes, a video recharge gate terminal at which said series of switched signals appear, and a dummy re-

charge gate terminal for producing a series of switched signals independent of said illumination;

an input resistor;

a single-ended preamplifier having an input and an output with said input connected to said video recharge gate terminal through said input resistor;

sample and hold means having a signal input, a signal output, and a timing input with said signal input connected to said output of said preamplifier to hold at its signal output a signal level corresponding to the level of the signal applied to said signal input at the time that a pulse is applied to said timing input; and

delay means connected between said source of said clock pulses and said timing input of said sample and hold means to delay the sampling time of said sample and hold means until the signal from said preamplifier output has reached a maximum value.

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**4,389,675**

## TELEVISION CAMERA APPARATUS

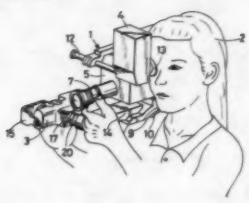
**Susumu Suzuki, Ayase, and Akitoshi Okuma, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 31, 1981, Ser. No. 249,655**

**Claims priority, application Japan, Apr. 5, 1980, 55-46016[U]**

**Int. Cl.³ H04N *5/26***

**U.S. Cl. 358—229** **3 Claims**



1. A portable television camera apparatus comprising:

(A) a camera body housing having a lens mount to which a lens body is mounted;

(B) a shoulder brace secured to a bottom portion of said camera body housing;

(C) a handgrip and mount provided on an arm which extends from said shoulder brace, said handgrip mount constructed as that said handgrip can be interchangeably mounted on either side of said arm; and

(D) a view finder mount including a mounting rod which extends laterally from said camera body and on which said electronic view finder is secured, to interchangeably mount said electronic view finder on either side of said camera body.

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**4,389,676**

## TELEVISION RECEIVER HIGH VOLTAGE PROTECTION CIRCUIT

**Alvin R. Balaban, Lebanon; Steven A. Steckler, Clark, both of N.J., and Ronald E. Fernsler, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.**

**Filed Dec. 15, 1980, Ser. No. 216,338**

**Int. Cl.³ H04N *5/68***

**U.S. Cl. 358—243** **19 Claims**

1. A disabling circuit for a television display that includes a high voltage generator to develop a picture tube ultor voltage, comprising:

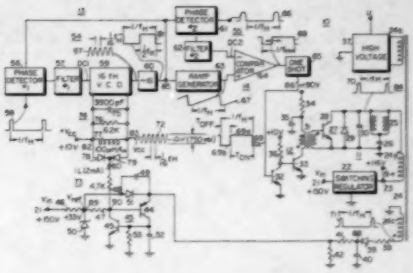
an inductive-capacitive resonant network;

means coupled to said inductive-capacitive resonant circuit for exciting said resonant network into sustained oscillation to develop and alternating output signal;

a high voltage generator responsive to said alternating output signal for developing a picture tube ultor voltage;

means for developing a signal representative of said ultor voltage;

means responsive to said ultor voltage representative signal for developing a disabling signal when said ultor voltage exceeds a predetermined level; and



a switching element responsive to said disabling signal to a short-circuit said resonant network for stopping said sustained oscillation to disable operation of said high voltage generator.

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**4,389,677**

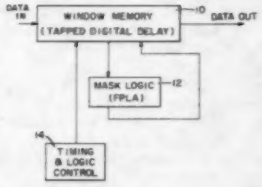
## METHOD AND APPARATUS FOR REMOVING ERRONEOUS ELEMENTS FROM DIGITAL IMAGES

**Robert J. Rushby, Waterloo, and Yashvant S. Parmar, Weston, both of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada**

**Filed Dec. 8, 1980, Ser. No. 213,767**

**Int. Cl.³ H04N *1/40*; G06F *11/00***

**U.S. Cl. 358—280** **12 Claims**




1. An apparatus for altering erroneous data elements generated by a thresholding operation during the scanning of a document to produce a facsimile image, comprising:

first means for receiving a plurality of data elements obtained by scanning said document, said first means including storage means for storing a specific number of said data elements at any particular time;

second means coupled to said first means for determining whether any of said data elements stored within said first means are erroneous and should be altered, said second means including means for selectively testing said stored data elements for errors, said testing means including multiple logic masks contained in a field programmable logic array device, said multiple logic masks being applied simultaneously to selectively test said stored data elements for errors;

third means, coupled to said first and second means, for altering any data elements which are deemed to be erroneous by said second means;

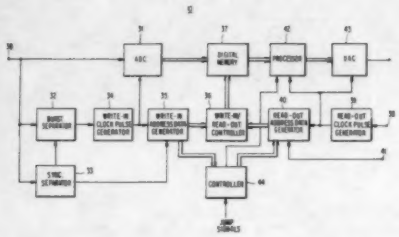
and control means, coupled to said first means, for generating a plurality of control signals for use in controlling the transfer of said data elements into and out of said first means.

## 4,389,678

## DIGITAL TIME-BASE CORRECTOR FOR SPECIAL MOTION REPRODUCTION BY HELICAL-SCAN VTR

Mineo Mizukami, and Tatsuo Konishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1980, Ser. No. 194,654
Claims priority, application Japan, Oct. 5, 1979, 54-129181; Oct. 5, 1979, 54-129182
Int. Cl.³ H04N 5/785
U.S. Cl. 360—10.3 7 Claims



1. A time-base corrector for correcting time-base errors in a television video signal reproduced by a rotary magnetic head in a helical-scan video tape reproducer from a magnetic tape on which a plurality of video tracks are formed diagonally with respect to the longitudinal direction of said tape, a television video signal of one or more fields being recorded on each of said video tracks, said tape being able to be transported at a reproducing tape speed different from a normal tape speed at which said television video signal is recorded on said tape, said rotary magnetic head being deflected in a direction perpendicular to said video tracks so that said magnetic head follows a single video track during a single scanning at said reproducing tape speed, said magnetic head jumping in a direction perpendicular to said video tracks by an amount equal to at least one video-track pitch, said helical-scan video tape reproducer providing jump signals representing the direction and amount of the jump of said magnetic head, said time-base corrector comprising:

(a) means for generating a first clock pulse in synchronism with said television video signal;

(b) means responsive to said first clock pulse for converting said television video signal to a digital video signal;

(c) digital memory means for storing said digital video signal;

(d) means for generating write-in address data, in response to (i) said first clock pulse, (ii) a first horizontal sync signal and (iii) a first vertical sync signal, said write-in address data designating an address at which said digital video signal is to be written into said digital memory, said write-in address data including write-in line address data and write-in point address data;

(e) means responsive to said jump signals for latching said write-in line address data into latch means at a time controlled by said jump signals;

(f) means for generating a second clock pulse in a synchronism with a reference signals;

(g) means for generating read-out address data, in response to (i) said second clock pulse, (ii) a second horizontal sync signal, and (iii) a second vertical sync signal, said read-out address data designating an address at which the stored digital video signal is read out from said digital memory means, said read-out address data including read-out line address data and read-out point address data;

(h) means responsive to said second vertical sync signal for transferring the latched data from said latching means to said read-out address data generating means as read-out line address data, the time of transferring said latched data being defined by said second vertical sync signal; and

(i) means responsive to said second clock pulse for converting said read-out digital video signal into an analog video signal.

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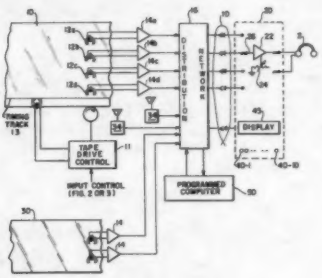
## 4,389,679

## LANGUAGE INFORMATION SYSTEM

Richard S. Missan, 301 E. 78th St., New York, N.Y. 10021, and Leslie M. Orloff, Huntington, N.Y., assignors to Richard S. Missan, New York, N.Y.

Continuation of Ser. No. 23,409, Mar. 23, 1979, which is a continuation of Ser. No. 772,843, Feb. 28, 1977. This application Dec. 22, 1980, Ser. No. 218,769
Int. Cl.³ G11B 5/00, 15/18
U.S. Cl. 360—12 17 Claims



1. An information system for explaining an event which occurs in a number of portions each of a predetermined time period comprising:

a storage medium having a plurality of tracks of audio information pre-recorded thereon in different languages in segments corresponding to the portions of the event, said event occurring external to the pre-recorded information,

means for reading the information from each track of the plurality of tracks,

means for selecting the track whose audio information is to be reproduced, means for aurally reproducing the audio information of the selected track,

and means responsive to selected occurrences of the event external of the pre-recorded information for synchronizing the reproduction of the pre-recorded information from all of the tracks of the storage medium in segments each of which corresponds with a particular portion of the event taking place.

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## 4,389,680

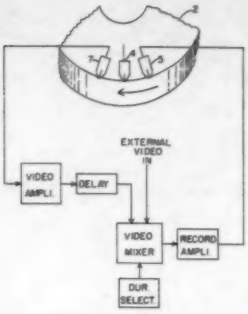
## SPECIAL EFFECTS EDITING METHOD AND APPARATUS USING RETRIEVED VIDEO

William D. Gramling, 5144 Newport Ave., Chevy Chase, Md. 20016

Filed Dec. 17, 1980, Ser. No. 217,131
Int. Cl.³ H04N 5/795
U.S. Cl. 360—14.1 6 Claims

1. In a video editing apparatus, a head assembly for receiving relatively moving video tape wherein at least a pair of transducers are mounted in a set on said head assembly, said transducers in said set comprising an erasing transducer followed by a recording transducer, the invention characterized by the addition of a further reproducing transducer in said set which retrieves the signals on video tape moving relative to said head assembly prior to said signals being erased by said erasing

transducer and means for mixing video signals from another source with signals retrieved by said reproducing transducer,




and transmitting said mixed signals to said recording transducer.

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**4,389,681**

## METHOD AND APPARATUS FOR RECORDING DIGITIZED INFORMATION ON A RECORD MEDIUM

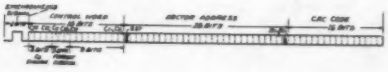
**Masato Tanaka; Takenori Sonoda, and Nobuhiko Watanabe, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jul. 27, 1981, Ser. No. 286,963**

**Claims priority, application Japan, Jul. 26, 1980, 55-102853; Jul. 26, 1980, 55-102854**

**Int. Cl.³ G11B *5/02, 5/09***

**U.S. Cl. 360—27** **35 Claims**



1. A method of recording at least one channel of digitized information signal in a selected number of data tracks on a record medium comprising the steps of:

providing a format control signal;

encoding at least one channel of an information signal into digital form;

modulating the encoded information signal;

recording the at least one channel of modulated, encoded information signal in a predetermined number of data tracks on said record medium;

at least one of said steps of encoding, modulating and recording being selectively controlled in accordance with said format control signal;

generating a control signal including control data responsive to said format control signal representing at least one of the following: (a) the number of tracks in which each channel or modulated, encoded information signal is recorded, (b) the encoding scheme used to encode said information signal, and (c) the type of modulation used to modulate said encoded signal; and

recording said control signal in a separate control track on said record medium.

**4,389,682**

## MAGNETIC RECORDING SYSTEMS

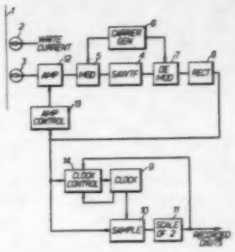
**Gordon G. Scarrott, Welwyn Garden City, England, assignor to International Computers Limited, London, England**

**Filed Aug. 25, 1980, Ser. No. 180,614**

**Claims priority, application United Kingdom, Aug. 31, 1979, 7930355**

**Int. Cl.³ G11B *5/09, 5/02***

**U.S. Cl. 360—45** **8 Claims**



1. Apparatus for reproducing digital information recorded on a magnetic medium as transitions between regions of the medium magnetised in opposite senses, the apparatus comprising:

a read head for outputting a read waveform on relative movement between the magnetic medium and the read head, the read waveform being composed of read pulses each resulting from the relative movement of a single one of the said transitions past the read head, and read pulses being subject to interference with one another;

means for transforming the read waveform into a transformed waveform, which means comprise in sequence a modulator arranged to modulate a carrier wave in accordance with an input derived from the output of the read head, surface acoustic wave transversal filter means and a demodulator arranged to remove the said carrier wave; and

means for extracting from the transformed waveform a digital signal dependent on the recorded information;

the response of the surface acoustic wave transversal filter means being such as to facilitate the extraction of the said digital signal by controlling the manner in which, or at least reducing the extent to which, the transformed versions of the read pulses interfere with one another.

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**4,389,683**

## SWITCH-TUNED FILTERS

**Guy Lelandais, Bure sur Yvette, France, assignor to Enertec, Montrouge, France**

**Filed Oct. 20, 1980, Ser. No. 198,564**

**Claims priority, application France, Oct. 31, 1979, 79 26969**

**Int. Cl.³ G11B *5/45, 5/02***

**U.S. Cl. 360—65** **11 Claims**

1. A switch-tuned filter for use in an equaliser in a magnetic tape recorder, comprising:

input means arranged to receive an input signal;

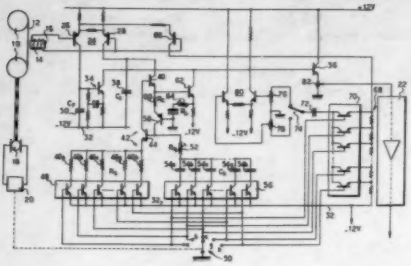
a capacitive filter responsively coupled to said input means to provide a first filtered signal;

a resonant filter responsively coupled to said input means to provide a second filtered signal, said resonant filter including a gyrator and having a frequency response dependent at least in part on circuit values in two circuit paths in said gyrator;

switch means arranged to select different circuit values in at least one of said paths;

amplitude control means responsively coupled to said input means to provide a controlled-amplitude signal;

means, coupled to said amplitude control means, for selectively inverting said controlled-amplitude signal; and



means responsively coupled to said capacitive filter, said resonant filter, and said inverting means to combine said first and second filtered signals with said said controlled amplitude signal.

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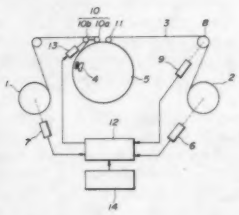
**4,389,684**

## MOVABLE TAPE-GUIDE CONTROL SYSTEM

**Toshiharu Aihara, Hino, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 3, 1981, Ser. No. 239,889**
**Claims priority, application Japan, Mar. 6, 1980, 55-27288**
**Int. Cl.³ G11B *15/32, 17/00, 19/02***
**U.S. Cl. 360—71** **5 Claims**



1. A movable tape-guide control system for a helical scan type magnetic recording and reproduction apparatus capable of guiding a magnetic tape relative to a rotary head drum by use of a pair of guide posts, comprising:

magnetic tape reel rotation speed detection means for producing a signal indicating the rotation speed of a magnetic tape reel;

magnetic tape running speed detection means for producing a signal indicating the running speed of a magnetic tape;

control signal generation means for detecting the approach of the end portion of said magnetic tape towards said guide posts based on said signal indicating the rotary speed of said magnetic tape reel and on said signal indicating the running speed of said magnetic tape, and for producing a control signal; and

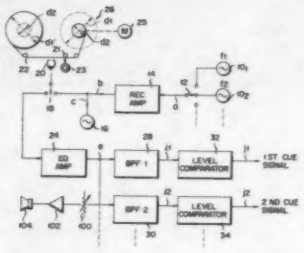
guide post drive means for moving at least one said guide post for guiding said magnetic tape to a predetermined position in accordance with said control signal generated from said control signal generation means, whereby said guide post is moved away from said rotary head drum by a predetermined distance so as to increase the space therebetween when said end portion of the magnetic tape comes near said guide post.

**4,389,685**

## CUE SIGNAL GENERATING SYSTEM

**Kenzi Furuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jul. 24, 1980, Ser. No. 171,970**
**Claims priority, application Japan, Aug. 23, 1979, 54-107516**
**Int. Cl.³ G11B *15/18, 5/43***
**U.S. Cl. 360—72.2** **6 Claims**




1. A cue signal generating system for a tape recorder having at least a recording mode and a cue signal detection mode, and which includes means for detecting cue signals recorded on a recording tape, means for causing said tape to travel by a take up reel drive during operation in the cue signal detection mode which produces a variable tape traveling speed during said cue signal detection mode, the variable tape traveling speed being a function of the tape roll diameter on the take up reel;

the cue signal generating system comprising means for producing and recording on said tape at least two different cue signals having the following relation:

$$f1/f2 > d1/d2$$

where d1 is the maximum tape roll diameter of said take up reel, d2 is the minimum tape roll diameter of said take up reel, f1 is first frequency information contained in a first cue signal of said at least two different cue signals, and f2 is second frequency information of a second cue signal of said at least two different cue signals, said recording second cue signal having a lower frequency than that of said first recorded cue signal, the ratio f1/f2 thereby being sufficiently large that there is substantially no overlap of said first and second frequency information (f1,f2) during cue signal detection in said variable speed cue signal detection mode.

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**4,389,686**

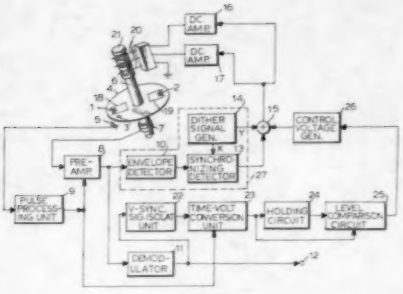
## TRACKING APPARATUS FOR USE IN A VIDEO TAPE RECORDER

**Takenobu Isaka, Hirakata, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 1, 1980, Ser. No. 211,713**
**Claims priority, application Japan, Dec. 7, 1979, 54-159551**
**Int. Cl.³ G11B *21/10***
**U.S. Cl. 360—77** **3 Claims**

1. A video signal reproducing device for reproducing video signals from a magnetic tape on which signals of unit lengths are recorded as video tracks inclined at a pescribed angle with respect to the lengthwise direction of said magnetic tape, said device being provided with: a tracking apparatus having video heads for scanning said video tracks so as to obtain reproduced signals, an electric-mechanical transducer for moving said video heads in a direction which is perpendicular to the scanning direction of said video tracks, a demodulator for demodulating said reproduced signals so as to obtain reproduced video signals, a vertical synchronizing separator circuit for separating vertical synchronizing signals from said reproduced video

signals, a pulse processing circuit for detecting rotary phases of said video heads, a time-voltage conversion circuit for converting cycles of said vertical synchronizing signals into a voltage by means of signals corresponding to said rotary phases of said video heads which are derived from said pulse processing circuit, a holding circuit for holding an output voltage of said time-voltage conversion circuit and said holding circuit, a control voltage generating circuit which compares a set reference voltage with an output of said level com-




parison circuit and which generates a voltage when said reference voltage and said output voltage are not equal to each other, a tracking control signal generating circuit for controlling said video head positions so as to track said video tracks, and an adder which adds an output signal from said control voltage generating circuit with an output signal from said tracking control signal generating circuit, so that signals derived from said adder are fed to said electric-mechanical transducer, thereby allowing said video heads to scan said video tracks.

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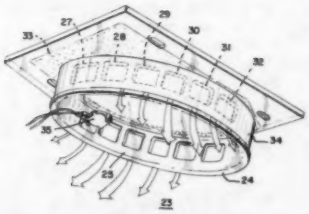
**4,389,687**

## EXHAUST AIR VALVE FOR MAGNETIC DISK DRIVES

**Arpad Gorove, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.**

**Filed Mar. 23, 1981, Ser. No. 246,923**
**Int. Cl.³ G11B *23/02***
**U.S. Cl. 360—98** **6 Claims**



**1.** In a magnetic disk drive comprising:
a plurality of rotatable magnetic disks;
magnetic heads riding over the surfaces of said disks;
an airtight enclosure for said heads and disks;
a source of pressurized air for said enclosures;
an improved air exhaust valve positioned over the outlet for pressurized air from said enclosure including:
an elliptical housing, one face of said housing being closed, the other face of said housing being open and being positioned over said outlet, the body of said elliptical housing having ports therein; and
an elastic band positioned over the body of said housing in engagement with said ports so that pressurized air escapes from said enclosure through said ports by expansion of said elastic band which otherwise seals said ports.

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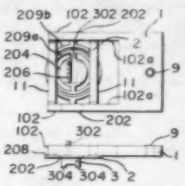
**4,389,688**

## MAGNETIC HEAD SUPPORTING MECHANISM

**Noboru Higashiyama, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 13, 1981, Ser. No. 224,678**
**Claims priority, application Japan, Jan. 22, 1980, 55/6110**
**Int. Cl.³ G11B *5/012, 5/48, 5/52, 21/16***
**U.S. Cl. 360—104** **10 Claims**



**1.** A magnetic head supporting mechanism comprising:
holder means;
a gimbal spring having edge portions fixed to said holder means, a central portion and a plurality of elastic ring portions connecting said edge and central portions;
a magnetic head fixed to said central portion; and
damper means comprising at least one elastic sheet in sliding surface contact with said gimbal spring, whereby at least a portion of the vibration of said magnetic head is absorbed by surface friction between said damper means and said spring.

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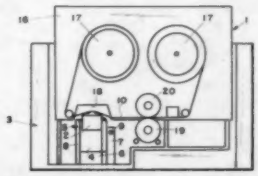
**4,389,689**

## METHOD AND APPARATUS FOR MOUNTING MAGNETIC TAPE HEADS

**Dewey M. Sims, Jr., Wayne, Mich., assignor to Northern Telecom Systems Corporation, Ann Arbor, Mich.**

**Filed Aug. 25, 1980, Ser. No. 180,841**
**Int. Cl.³ G11B *21/24***
**U.S. Cl. 360—109** **27 Claims**



**1.** An arrangement for mounting magnetic tape heads and the like, comprising:
a mounting plate adapted for fitedly attaching a magnetic tape head therewith, and including first and second side edges;
a housing having a base and first and second upstanding sidewalls between which said first and second mounting plate side edges are respectively received;
means for pivotally supporting said mounting plate on said housing base for pivotal motion thereon;
means for adjusting the angular orientation of said mounting plate to an aligned position, wherein the magnetic head assumes a predetermined relationship with respect to a magnetic tape sliding thereover;
first and second channels positioned in said first and second mounting plate side edges and housing sidewalls respec-

tively, and extending therealong to an end of one of said mounting plate and said housing sidewalls; and

a solidifying plastic material injected into said first and second channels from said end, said material being curable to form first and second keys in said first and second channels which positively interconnect said mounting plate and said housing in the aligned position.

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**4,389,690**

## MAGNETIC TAPE CASSETTE INCLUDING A LOCKING MECHANISM

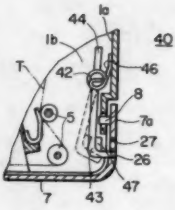
**Kengo Oishi; Osamu Suzuki, and Choji Komiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 6, 1981, Ser. No. 232,271**

**Claims priority, application Japan, Feb. 8, 1980, 55-15004[U]**

**Int. Cl.³ G11B *23/04***

**U.S. Cl. 360—132** **7 Claims**




1. A magnetic tape cassette in which a magnetic tape wound on a pair of hubs in a hollow interior of a cassette casing is guided to run across a front opening formed in said casing and can be pulled out of said front opening, and including a locking mechanism comprising:

a supporting shaft fixed to a bottom wall of said cassette casing;

a rotary hub rotatably mounted on said supporting shaft;

a locking lever extending from said rotary hub for rotating with said rotary hub;

a first stop extending from said hub in a direction substantially opposite to a direction of extension of said locking lever, said first stop rotating with said locking lever;

means for limiting a range of rotation of said first stop to limit a range of rotation of said locking lever as said locking lever rotates with said rotary hub; and

a coil spring having a first end portion thereof locked to said hub, a coil portion thereof disposed around said hub and a second end portion thereof abutted against an inner surface of a side wall of said cassette casing.

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**4,389,691**

## SOLID STATE ARC SUPPRESSION DEVICE

**Harold E. Hancock, Cincinnati, Ohio, assignor to Power Management Corporation, Centerville, Ohio**

**Continuation-in-part of Ser. No. 49,852, Jun. 18, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,694**

**The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.**

**Int. Cl.³ H02H *7/22***

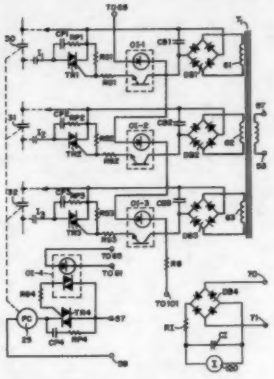
**U.S. Cl. 361—8** **12 Claims**

1. Apparatus adapted to be connected to an existing power contactor without modification thereof, which power contactor includes a solenoid connected to operate at least one pair of power contacts, said apparatus controlling the operation of the power contactor in response to an externally generated control signal and for suppressing arcing at the power contacts during opening and closing thereof, said apparatus including

gate controlled thyristor means connectable in parallel with each of said power contacts,

means for providing a source of direct current for the gate of said thyristor means,

circuit means responsive to the application of the control signal including means for applying current to the solenoid of said power contactor and further including first solid state gate circuit means having a substantially immediate output of predetermined duration in response to the application of the control signal for applying gating current to said thyristor means prior to, during, and for a



limited period of time following closure of the power contacts, and

said circuit means also being responsive to the removal of the control signal for removing current from the solenoid and further including second solid state gate circuit means having a substantially immediate output of predetermined duration in response to the removal of the control signal for applying gating current to said thyristor means prior to, during, and for a limited period of time following the opening of the power contacts.

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**4,389,692**

## OVERLOAD-PROTECTED SWITCHING APPARATUS FOR ELECTRICAL STARTER SYSTEM FOR COMBUSTION ENGINES

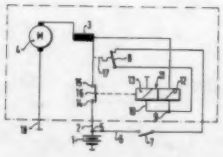
**Klaus Sander, Leonberg, and Hans Würth, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jan. 21, 1981, Ser. No. 226,721**

**Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002232**

**Int. Cl.³ H02H *7/08, 5/04***

**U.S. Cl. 361—29** **9 Claims**



1. Overload-protected electrical starter circuit switching system, particularly for starting of internal combustion engines, and adapted for energization by a current source (1) comprising

a supply cable connection including a starter cable (2), a cable terminal (20) on the starter cable, and starter relay contacts (14, 15, 16), said cable terminal being mechani-

cally and electrically connected to one (15) of the starter relay contacts (14–16) connecting the current source (1) to a starter motor (3, 4) through the relay contacts,

a relay coil circuit (6,7, 11) including a starter switch (7), connectable to said source (1) for energizing the coil (11, 12, 13) of the relay upon closing of a starter switch (7),

a thermostat switch unit (8, 17) having switching contacts connected in the relay coil circuit, and a temperature sensing portion (17);

and wherein, in accordance with the invention,

the thermostatic switch unit (8, 17) is externally mechanically attached to said cable terminal (20), electrically separate therefrom, and in heat transfer relation thereto, and the switching contacts are connected for disabling the relay coil circuit and hence interrupt current supply to the starter motor upon increase of temperature of the cable terminal beyond a predetermined limit.

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**4,389,693**

## LIGHTNING ARRESTER

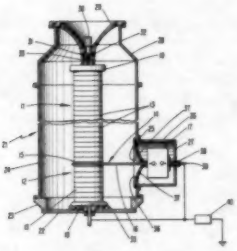
**Satoru Yanabu, Machida; Susumu Nishiwaki, Yokohama; Mizuho Yamashita, Yokohama; Toshikazu Satoh, Yokohama; Yoichi Murakami, Yokohama, and Susumu Imai, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 116,968, Jan. 3, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,639**

**Claims priority, application Japan, Jan. 31, 1979, 54-9128**

**Int. Cl.³ H02H** *9/04*

**U.S. Cl. 361—127** **4 Claims**



1. A lightning arrester comprising:

at least two stacks of non-linear resistors, each including a plurality of non-linear elements constructed of a metal oxide, and connected in series;

arcing gap means connected in parallel to one of said stacks and operable to shunt said one stack of resistors to ground, said arcing gap means including electrodes which are spaced apart a distance not less than about 0.8 mm;

a hermetically sealed housing enclosing said stacks of resistors and said arcing gap means and filled with sulfur hexafluoride gas at a gauge pressure not less than 2 $kg/cm^2$;

the impedance of said one stack of resistors being between about 15 to about 35% of the total impedance of the two stacks of resistors when said arcing gap means sparks over; and

the rated voltage of the arrester being not less than about 50 KV.

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**4,389,694**

## CABLE CONTINUITY MONITORING SYSTEM

**Robert Cornwell, Jr., Bluefield, W. Va., assignor to PEMCO Corporation, Bluefield, W. Va.**

**Filed Oct. 8, 1980, Ser. No. 195,117**

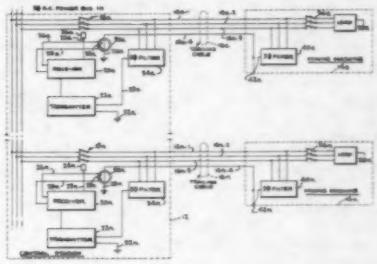
**Int. Cl.³ H02H** *5/10*

**U.S. Cl. 361—48** **13 Claims**

1. A conductor continuity monitoring system for monitoring the continuity of a plurality of cables, each of said cables extending from a common power source to a corresponding one of a plurality of loads to be energized, said monitoring system comprising:

(a) a plurality of transmitter means, each of said transmitter means transmitting a monitoring signal of predetermined amplitude and frequency to and from a corresponding one of said plurality of loads via a corresponding one of said plurality of cables;

(b) a plurality of receiver means, each of said receiver means receiving monitoring signals returned via a corresponding one of said plurality of cables and via said common power source and determining whether the received monitoring signals are within a predetermined frequency range and above a predetermined amplitude to provide a manifestation indicative thereof, one of said plurality of transmitter means and of receiver means being coupled to one end of said one corresponding cable and said corresponding one load being coupled to the other end of said one corresponding cable; and



(c) a plurality of reference means, each associated with each of said plurality of cables and with a corresponding one of said plurality of transmitter means and responsive to the frequency of the received monitoring signals for generating a reference signal of a frequency substantially equal to the frequency of the received monitoring signals, each of said plurality of transmitter means responsive to said reference signal of said corresponding one of said plurality of reference means for transmitting its monitoring signal at substantially the same frequency as that of the other monitoring signals as transmitted by the other of said plurality of transmitter means, whereby said plurality of monitoring signals as transmitted over said plurality of cables are of substantially the same frequency and as a result no difference signals are produced as would result from frequency shifts being imposed on other ones of said monitoring signals as appear on said plurality of cables and said common power source.

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**4,389,695**

## EQUIPMENT FOR PROTECTING ELECTRONIC EQUIPMENT AND PERSONNEL AGAINST INADVERTENT OCCURRENCE OF EXTENDED OR TRANSIENT HIGH VOLTAGES AND METHOD

**Roy B. Carpenter, Jr., 17001 Bracewood Dr., Hacienda Heights, Calif. 91745**

**Filed Feb. 9, 1981, Ser. No. 232,540**

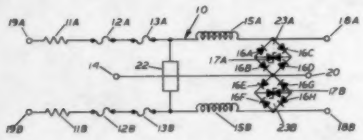
**Int. Cl.³ H02H** *9/06*

**U.S. Cl. 361—55** **2 Claims**

1. Equipment for protecting electronic equipment and personnel against inadvertent occurrence of extended or transient voltages, having a first line equipped with an input and an output terminal, respectively, and a second line equipped with an input and an output terminal, respectively, for the connection between an incoming power source and the to be protected equipment, comprising:

a first input terminal,

a first current-limiting resistor,
a first low-voltage fuse,
a first high-voltage fuse,
a first resistive inductor,
said first current-limiting resistor, said first low-voltage fuse, said first high-voltage fuse and that first resistive inductor connected in series and in this order between said first input terminal and said first output terminal of said first line,
a second current-limiting resistor,
a second low-voltage fuse,
a second high-voltage fuse,
a second resistive inductor,
said second current-limiting resistor, said second low-voltage fuse, said second high-voltage fuse and said second resistive inductor connected in series and in this order between said second input terminal and said second output terminal of said second line,




a dual chamber gas-filled tube having a first, a second, and a center terminal, connected across said first and said second line, said first terminal connected to said first line between said first high-voltage fuse and said first resistive inductor, said second terminal connected to said second line between said second high-voltage fuse and said second resistive inductor, said center terminal connected to a first terminal for connection to ground,
four first diodes forming the arms of a first balanced bridge, one diagonal of which is connected across said first line and said first terminal to ground,
a first avalanche diode forming the other diagonal of said first balanced bridge,
four second diodes forming the arms of a second balanced bridge, one diagonal of which is connected across said second line and said first terminal to ground,
a second avalanche diode forming the other diagonal of said second bridge.

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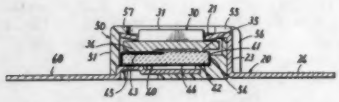
**4,389,696**

## TRIMMER CAPACITOR

**Yukihiro Azuchi, Sabae, Japan, assignor to Murata Manufacturing Co., Ltd., Japan**

**Filed Sep. 11, 1980, Ser. No. 186,257**
**Claims priority, application Japan, Sep. 17, 1979, 54-128899[U]**
**Int. Cl.³ H01G 5/06**
**U.S. Cl. 361—293** **12 Claims**




1. A trimmer capacitor, comprising:
(a) an insulating case;
(b) a stator terminal having one end embedded in said insulating case and having another end extending from said insulating case for external electrical connection;
(c) a dielectric stator fixedly receiving in said insulating case and including a dielectric member;
(d) a stator electrode electrically connected to said stator terminal;
(e) a conductive rotor received within said insulating casing and having:
(1) a first step projecting from its upper surface;
(2) a second step projecting from a first portion of its lower surface, which surface faces said stator electrode, said second step having a lower end surface which defines a rotor electrode, said rotor electrode contacting said stator and being spaced from said stator electrode through said dielectric member of said dielectric stator; and
(3) a third step projecting from said lower surface of said rotor and defining an idle electrode, said third step projecting the same distance from said lower surface as said second step, said second and third steps of said metal rotor being located on said lower surface thereof at positions directly opposite to each other in the diametrical direction;
(f) a conductive rotor terminal extending through said insulating case and having at one end thereof a dish-shaped spring portion, said dish-shaped spring portion being centrally formed with a throughgoing hole, said hole rotatably receiving said first projecting step of said conductive rotor to effect electrical contact between said upper surface of said conductive rotor and said rotor terminal around the entire periphery of said first projecting step, contact between said dish-shaped spring portion and said upper surface being made at a position opposite said idle electrode at all rotational positions of said rotor, said rotor terminal having another end that is led out of said insulating case for external electrical connection; and
(g) said insulating case being made of thermal plastic and having an upper edge that is bent inward by heating to retain said dielectric stator, said conductive rotor and said rotor terminal within said insulating case, said bent in upper edge being in pressure engagement with said dish-shaped spring portion formed at one end of said rotor terminal, said insulating case being formed with a notch at said upper edge thereof, said other end of said rotor terminal being let out through said notch of said insulating case, said rotor terminal including a portion at said other end thereof which extends outside said insulating case along the outer side surface thereof, said insulating case being intricately formed at said outer side surface thereof with a pair of clamp portions for engaging at least a portion of said other end of said rotor terminal therebetween.

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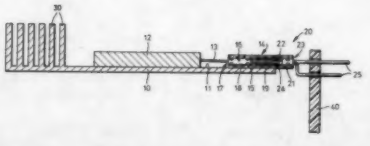
**4,389,697**

## CIRCUIT ASSEMBLY HAVING A COMPONENT WITH LEADS EXTENDING THEREFROM AND A CONNECTOR BOTH SUPPORTED ON A PLANAR SUBSTRATE

**Melvyn R. Bell, Woodbank; John M. Morrison, and Charles M. Stewart, both of Edinburgh, all of Scotland, assignors to Ferranti plc, Gatley, England**

**Continuation of Ser. No. 18,572, Oct. 3, 1979, abandoned. This application Jul. 31, 1981, Ser. No. 288,807**
**Int. Cl.³ H05K 7/02**
**U.S. Cl. 361—380** **1 Claim**




1. A circuit assembly comprising an at least substantially planar substrate, at least one component with leads extending therefrom, at least one connector having a plurality of electri-

cally conducting connector pieces, each connector piece being directly connected with a lead of said at least one component, the plurality of connector pieces being secured at a block of electrical insulating material of the connector, said at least one component being secured to one major surface of said substrate and said at least one connector being coherently secured to said one major surface of said substrate, and a second connector secured to the at least one connector and further providing connector pieces for the second connector extending substantially parallel to said one major surface, comprising terminals of the circuit assembly, and in which at least substantially the whole of at least some of the leads of said at least one component extends at least substantially parallel to said one major surface of the substrate.

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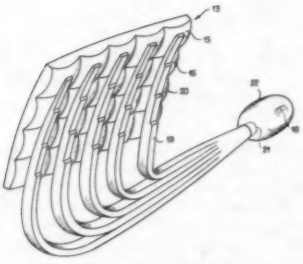
**4,389,698**

## HEADLAMP INTER ALIA FOR MOTOR VEHICLES

**Pierre Cibie, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France**

**Filed Dec. 16, 1980, Ser. No. 217,281**
**Claims priority, application France, Dec. 20, 1979, 79 31257**
**Int. Cl.³ F21V 7/04**
**U.S. Cl. 362—32** **8 Claims**



1. A motor vehicle headlamp, comprising:
(a) a lens having a plurality of juxtaposed dioptric elements, at least some of said dioptric elements being arranged in a row,
(b) a light-transmitting bar extending along the row of dioptric elements adjacent to the interior surface of the lens, said bar carrying a reflecting zone opposite each dioptric element in the row,
(c) a light source spaced from the lens, and
(d) an optical duct terminating at one end in said transparent bar and at its other end near the light source,
(e) whereby light from the light source is transmitted along the light-transmitting bar, the light being reflected by each reflecting zone through its respective dioptric element to create a light beam issuing from the headlamp.

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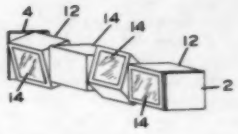
**4,389,699**

## SWIVEL CELL LIGHT FIXTURE

**Ned S. Qualls, Downingtown, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.**

**Filed Sep. 11, 1981, Ser. No. 301,302**
**Int. Cl.³ F21S 3/00**
**U.S. Cl. 362—217** **2 Claims**

1. A light fixture capable of directing light in several different directions, said light fixture comprising:
(a) a support structure for a single fluorescent tube, said support structure being
(1) two end plates having positioned thereon means for receiving the ends of a fluorescent light tube,
(2) a support bar positioned between said two end plates and rigidly holding the two end plates in position,
(3) a single fluorescent light tube positioned between the two end plates in its tube end receiving means and in a parallel relationship with the support bar,
(b) a plurality of individual adjustable reflectors for directing light from said single fluorescent light tube in a plurality of different directions, at least four or more reflectors being positioned around said single fluorescent light tube, each said reflector being:
(1) a housing having an open end, a reflective surface within said housing directing illumination from a source of illumination within the housing outwardly through the open end of the housing,
(2) said housing having two opposite side walls each with an aperture therein, said support bar and said single



fluorescent light tube passing through the apertures in each of the two side walls, said side wall apertures being such that they position the fluorescent tube in position to function as the source of illumination for providing light rays which the reflective surface will now direct outwardly from the open end of the housing, said apertures of the housing having a plurality of notches around the periphery thereof, said support bar being positioned in one set of notches and said housing being movable to position said support bar in different sets of notches around the periphery of the apertures so that the reflector housing will have its open end pointed in a plurality of different directions around a 360° arc.

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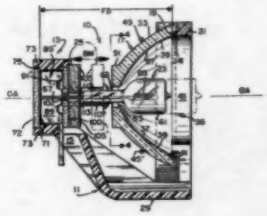
**4,389,700**

## PROJECTION UNIT WITH SEPARABLE LAMP CAPSULE AND SLIDABLE MEANS FOR EJECTING SAME

**Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Apr. 13, 1981, Ser. No. 253,333**
**Int. Cl.³ F21V 7/00**
**U.S. Cl. 362—306** **21 Claims**



1. A projection unit comprising:
an electrically insulative holder including front and rear upstanding portions, said front upstanding portion including an opening therein and defining a forward reference surface thereon;
a socket positioned on or forming part of said rear upstanding portion of said holder, said socket defining a rear reference surface thereon, said rear reference surface located at a predetermined, fixed distance from said forward reference surface;
a reflector located within said holder, said reflector having a

concave reflecting portion defining a forward aperture and including a front reference surface thereon, and a rear apex portion defining an opening therein, said front reference surface of said reflector mating with said forward reference surface of said holder in a preestablished manner whereby said forward aperture of said reflector is aligned with said opening within said front upstanding portion;

a lamp removably positioned with said socket and oriented in a non-contacting relationship with said reflector, said lamp including an envelope portion located substantially within said concave reflecting portion of said reflector when said lamp is postioned within said socket, a sealed end portion adjacent said envelope portion and located substantially within said opening within said rear apex portion of said reflector when said lamp is positioned within said socket, and a pair of lead-in wires located within said sealed end portion of said lamp and having portions thereof projecting from said sealed end portion for being electrically connected to said socket when said lamp is positioned therein, at least one of said lead-in wires positioned within said socket in contact with said rear reference surface of said socket when said lamp is positioned therein; and

slidable ejection means located substantially between said socket and said reflector for engaging said lamp when sad lamp is positioned within said socket and ejecting said lamp from said socket whereby said lamp will pass through said forward aperture of said reflector and said opening within said front upstanding portion of said holder, said slidable ejection means comprising at least one slide member and an elongated bar member movably positioned on said slide member, said elongated bar member engaging said sealed end portion of said lamp to effect said ejection of said lamp.

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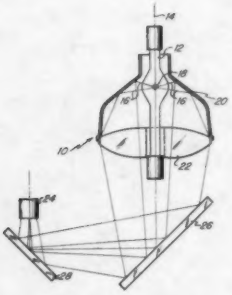
**4,389,701**

## ILLUMINATION SYSTEM

**Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.**

**Filed Oct. 27, 1980, Ser. No. 200,780**
**Int. Cl.³ F21V *7/04, 13/04***
**U.S. Cl. 362—308** **10 Claims**




1. An illumination system comprising:

a source of light disposed along a central axis of the illumination system for radiating light outwardly from the central axis;

a conical reflector coaxially disposed about the source of light for forming an annular virtual image of the source of light; and

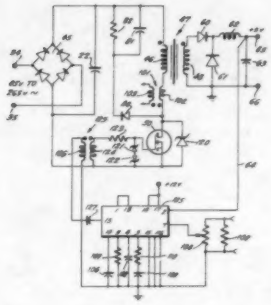
a lens coaxially disposed about the central axis of the illumination system for providing a circular real image of the annular virtual image of the source of light.

**4,389,702**

## SWITCHING POWER SUPPLY CIRCUIT HAVING CONSTANT OUTPUT FOR A WIDE RANGE OF INPUT VOLTAGE

**Stefano Clemente, Rancho Palos Verdes; Brian R. Pelly, Palos Verdes Estates, and Rutton Ruttonsha, Torrance, all of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.**

**Continuation of Ser. No. 179,695, Aug. 20, 1980, abandoned.**
**This application Aug. 27, 1982, Ser. No. 412,103**
**Int. Cl.³ H02M *3/335***
**U.S. Cl. 363—21** **4 Claims**



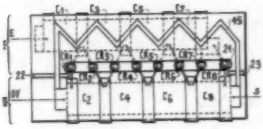
1. A switching regulator comprising, in combination: an input rectifier circuit means, an inverter circuit comprising transformer means and transistor switching means in series with said transformer means and connected to the output of said input rectifier circuit means; an output circuit magnetically coupled to said transformer means for producing a relatively high frequency output a-c voltage at the frequency of switching of said transistor switching means; output rectifier means connected to said output circuit for rectifying said output a-c voltage and for producing a relatively constant output d-c voltage; said transistor switching means having a control electrode control circuit means connected to said transistor switching means control electrode for varying the conduction time of said transistor switching means in a manner to maintain said output d-c voltage at a constant value regardless of variation of the voltage output of said input rectifier circuit means within a given, relatively wide range; and unidirectional clamping circuit means connected in parallel with said transformer means to clamp one polarity of the instantaneous voltage across said transformer means to a value which is lower than the instantaneous value of voltage of the opposite polarity across said transformer means, and producing an asymmetry in the voltage wave form appearing across said transformer means; said unidirectional clamping circuit means being conductive for at least a substantial portion of the time when said transistor switching means is not conductive, so that energy stored in said transformer means when said transistor switching means is conductive is dissipated by said clamping circuit means over said substantial portion of the time when said transistor switching means is not conductive, whereby the peak-to-peak voltage across said transistor switching means is reduced from that which would be produced in the absence of said clamping circuit means; said input rectifier circuit means being connected to an input a-c source which has a voltage within the range from 85 volts to about 265 volts, said transistor switching means consisting of a single power MOSFET; said single power MOSFET transistor having a voltage rating which is less than the peak-to-peak voltage of the maximum voltage within said range of said input a-c source.

4,389,703

## INTEGRATED VOLTAGE MULTIPLIER

Gilbert Morel; Pierre Frappart, and Roland Saint Marcoux, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 10, 1981, Ser. No. 233,122
Claims priority, application France, Feb. 12, 1980, 80 03046
Int. Cl.³ H02M 7/10
U.S. Cl. 363—61 5 Claims



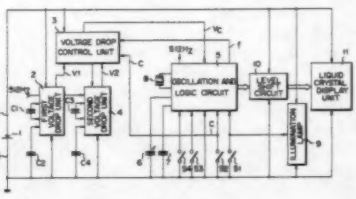
1. An integrated voltage multiplier made in accordance with multilayer technology as a monolithic block comprised of at least two independent groups of series-connected capacitors with diodes interconnecting the capacitors of said two groups, comprising a stack of metallized sheets with metallized parts arranged so that capacitors are formed which are series-connected, means defining at least first, second and third slots between said groups, said first and second slots adjusting the input and output capacitance of said multiplier and a plurality of diodes housed in said third slot for interconnecting the capacitors of said groups.

4,389,704

## POWER SOURCE SUPPLY SYSTEM

Ken Sasaki, Higashiyamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,473
Claims priority, application Japan, Oct. 19, 1979, 54-135357
Int. Cl.³ H02M 3/06
U.S. Cl. 363—62 18 Claims



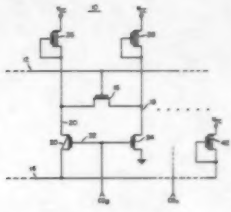

1. A power supply system for an electronic device comprising:
an electric cell power source;
first voltage dropping means coupled to said electric cell power source for outputting a first dropped voltage by dropping an output voltage from said electric cell power source to half its value;
second voltage dropping means coupled to said first voltage dropping means for providing a second dropped voltage by dropping said first dropped voltage obtained from said first voltage dropping means to half its value; and
a logic circuit including an oscillation circuit to which said second dropped voltage is applied, and a watch circuit for providing a time display signal by frequency dividing an oscillation signal from said oscillation circuit.

4,389,705

## SEMICONDUCTOR MEMORY CIRCUIT WITH DEPLETION DATA TRANSFER TRANSISTOR

Douglas P. Sheppard, Grapevine, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Aug. 21, 1981, Ser. No. 294,842
Int. Cl.³ G11C 17/00, 7/00
U.S. Cl. 365—104 4 Claims



1. A semiconductor memory circuit, comprising:
a word line connected to receive a first address signal;
a column decode line connected to receive a second address signal;
a bit line;
a memory cell for storing a data state, said memory cell connected to be accessed by said first address signal received through said word line for driving said bit line to a voltage state corresponding to the data state stored in said memory cell; and
a depletion data transfer transistor having the gate terminal thereof connected to said column decode line and the drain and source terminals thereof connected between said bit line and said data line for selectively connecting said bit line and said data line in response to said second address signal received through said column decode line.

4,389,706

## DIGITAL COMPUTER MONITORED AND/OR OPERATED SYSTEM OR PROCESS WHICH IS STRUCTURED FOR OPERATION WITH AN IMPROVED AUTOMATIC PROGRAMMING PROCESS AND SYSTEM

John W. Gomola; Theodore C. Giras; William G. Wood, all of Pittsburgh; Richard E. Putman, Penn Hills; Rodney E. Gilbreath, Pittsburgh, all of Pa.; John S. Deliyannides, Wilmington, Del.; Terry B. Cullen, and F. David Jones, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

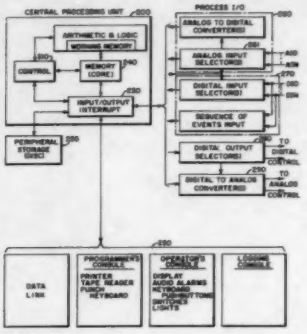
Continuation-in-part of Ser. No. 250,061, May 3, 1972, abandoned, and Ser. No. 250,451, May 4, 1972, abandoned. This application May 5, 1972, Ser. No. 250,826
Int. Cl.³ G06F 15/20
U.S. Cl. 364—130 76 Claims
MICROFICHE APPENDIX INCLUDED
(10 Microfiche, 906 Pages)

1. An automatically programmable signal monitoring or process control system for controlling an industrial system or the like comprising:
sensor means associated with the apparatus for generating signals indicative of the state of the system;
a digital computer system having a memory;
signal scanning means associated with said computer system

and connecting to said sensor means for scanning said sensor signals periodically and including means for transferring a digital record of the status of said signals into the memory of said digital computer system;

at least one machine readable signal-related event definition defining as an event either the periodic scanning or a particular change in the state of at least one sensor signal including a designation which serves as a name for the event and also as a name for the signal, and including a reference to the location in said memory where the status record of the corresponding signal variable is stored;

at least one machine readable job definition including at least one triggering reference to a designation which serves as




a name for an event and for a signal and which is included in at least one event definition;

loader means for operating said computer system to accept said event and job definitions and to store said definitions in said memory;

trigger-connect means for operating said computer system to link job definitions, but only those containing trigger references to designations, to locations in said memory that are in turn linked to the event definition and status data for the designated signals; and

means for operating said computer system to respond to the occurrence of a signal-related event by initiating execution of any and all job definitions which are linked to the status data and definition corresponding to that event.

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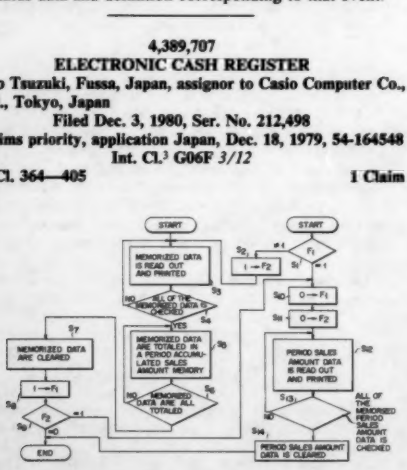
**4,389,707**

## ELECTRONIC CASH REGISTER

**Hanzo Tsuzuki, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Dec. 3, 1980, Ser. No. 212,498**
**Claims priority, application Japan, Dec. 18, 1979, 54-164548**
**Int. Cl.³ G06F *3/12***
**U.S. Cl. 364—405** **1 Claim**


START
MEMORIZED DATA IS READ OUT AND PRINTED
ALL OF THE MEMORIZED DATA IS CHECKED
NO
YES
MEMORIZED DATA ARE CLEARED
MEMORIZED DATA ARE TOTALED IN A PERIOD ACCUMULATED SALES AMOUNT MEMORY
MEMORIZED DATA ARE ALL TOTALED
END
START
PERIOD SALES AMOUNT DATA IS READ OUT AND PRINTED
ALL OF THE MEMORIZED PERIOD SALES AMOUNT DATA IS CHECKED
PERIOD SALES AMOUNT DATA IS CLEARED

1. An electronic cash register comprising:

a keyboard having data input keys and function keys, said function keys including first and second settlement designation keys;

a central processing unit coupled to said keyboard for processing data inputted through said keyboard;

a first total memory coupled to said central processing unit and having a plurality of memory areas for causing sales data inputted through said keyboard to be cumulatively stored according to classified items of commodities sold;

a second total memory coupled to said central processing unit and having a number of memory areas corresponding to the number of memory areas of said first total memory for causing total sales data to be cumulatively stored according to the classified items; and

printing means for causing the total sales data read by said central processing unit out of said first total memory to be sequentially printed when the first settlement designation key is operated, and for causing the total sales data read by the central processing unit out of said second total memory to be sequentially printed when the second settlement designation key is operated;

said central processing unit including a flag memory for storing flag data indicating the time immediately following the readout and printing of the sales data in said first total memory, and means coupled to said flag memory for causing the total sales data of the classified items in said first total memory to be cumulatively stored in the corresponding memory areas of said total memory when no flag data is stored in said flag memory upon actuation of the section settlement designation key, and thereafter for causing the data in said second total memory to be supplied to said printing means for printing.

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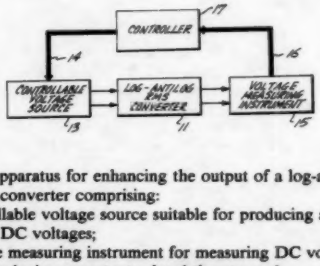
**4,389,708**

## METHOD AND APPARATUS FOR ENHANCING THE OUTPUT OF AN RMS CONVERTER

**K. Paul Baldock, Marysville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.**

**Filed Aug. 25, 1980, Ser. No. 180,523**
**Int. Cl.³ H03K *5/00***
**U.S. Cl. 364—573** **22 Claims**




12. An apparatus for enhancing the output of a log-antilog type RMS converter comprising:

a controllable voltage source suitable for producing a variety of DC voltages;

a voltage measuring instrument for measuring DC voltages and producing an output related thereto; and,

a controller connected to said controllable voltage source and to said voltage measuring instrument for:

controlling the output of said controllable voltage source;

receiving the output of said voltage measuring instrument;

determining the positive and negative gain ($G_{30}$ and $G_{31}$) and offset voltage ($V_{0+}$ and $V_{0-}$) characteristics of a log-antilog type RMS converter having its input connected to the output of said controllable voltage source and its output connected to the input of said voltage measuring instrument based on the value of DC voltages applied to said log-antilog type RMS converter by said controllable voltage source and the related output of said log-antilog type RMS converter measured by said voltage measuring instrument; and,

using said positive and negative gain and offset voltage characteristics to correct the output of said log-antilog

type RMS converter for nonlinearities in the AC/DC transfer characteristic of said log-antilog type RMS converter when an unknown AC signal is applied to said log-antilog type RMS converter.

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## 4,389,709
## PROGRAMMABLE INDICATOR SYSTEM

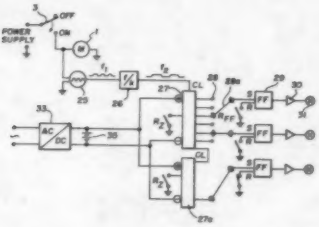
**Ernst Knibiehler, Basel, and Georg Hirmann, Zürich, both of Switzerland, assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Oct. 8, 1980, Ser. No. 195,033**

**Claims priority, application Switzerland, Oct. 3, 1979, 8910/79**

**Int. Cl.³ G06M *3/02***

**U.S. Cl. 364—551** **3 Claims**



1. A programmable system for indicating the expiration of appropriate time spans to perform preventive maintenance operations upon a machine tool comprising:

a signal generator adapted to be connected to the machine tool to generate signals whenever the tool is in operation,

integrating means connected to said generator to accumulate said signals with at least two threshold sensitive outputs,

at least two respectively resettable storage means inter-connected between said outputs and at least two respectively indicator means for indicating the advent of the particular maintenance operations,

a programming unit comprising a plurality of switches to selectively connect said indicator means via said storage means to said outputs.

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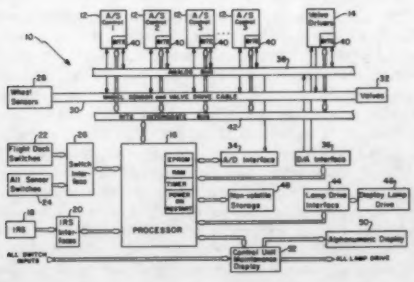
## 4,389,710
## BRAKING SYSTEM TEST CIRCUIT

**John P. Rasmussen, Clinton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio**

**Filed Jan. 12, 1981, Ser. No. 224,418**

**Int. Cl.³ G06F *11/32*; G01R *15/12***

**U.S. Cl. 364—551** **5 Claims**



1. In a braking system for an aircraft having antiskid control circuits associated with the brakes of the wheels thereof, the improvement, comprising:

a digital processor;

interface circuit means interconnected between said processor and the antiskid control circuits for exercising selected circuit functions of the antiskid control circuits under direction of said processor, sensing responses to said selected functions, and providing such responses to said processor for evaluation of the operability of the antiskid control circuits; and

wherein said interface circuit means exercises said selected circuit functions by the application of stimuli which simulate actual responses in the antiskid control circuits resulting from the braking of the aircraft on a runway and wherein said interface circuit means comprises:

first gating means for receiving excitation signals from said processor and applying such signals as inputs to selected test points on the associated antiskid control circuit;

second gating means for receiving response signals from additional selected test points on the associated antiskid control circuit, said response signals resulting from said excitation signals, said second gating means passing said response signals to said processor;

said first gating means comprising an analog switch connected to and addressed by said processor and converter circuit means interconnected between said processor and analog switch for converting digital excitation signals from said processor to states usable by the antiskid control circuits, said converter circuit means comprising both digital to analog and voltage to frequency converters; and

said second gating means comprising an analog selector connected to and addressed by said processor, and an analog to digital converter interposed between said analog selector and processor for converting said response signals form an analog to digital form.

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## 4,389,711
## TOUCH SENSITIVE TABLET USING FORCE DETECTION

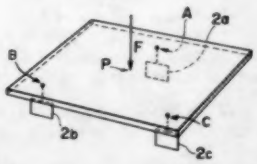
**Masao Hotta, Hachioji; Yoshikazu Miyamoto, Kokubunji; Norio Yokozawa, Fuchu, and Yoshimitsu Oshima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 11, 1980, Ser. No. 177,058**

**Claims priority, application Japan, Aug. 17, 1979, 54-104007; Sep. 19, 1979, 54-119420**

**Int. Cl.³ G08C *21/00***

**U.S. Cl. 364—556** **11 Claims**



1. A touch sensitive tablet using force detection wherein magnitudes of component forces at three fulcra, of an external force applied to one point on a faceplate are detected so as to evaluate coordinates of the point to which the external force has been applied; comprising conversion means to convert the component forces at each fulcrum into electric signals, sensing means to sense that no force components are present at each fulcrum as an indication that no force is applied, memory means to store the output signals of said conversion means at each fulcrum as offset values at, at least, one point of time in the period in which no force is applied, control means to control writing of the output signals of said conversion means into said memory means upon receiving an output of said sensing

means, subtraction means to subtract outputs of said memory means from the outputs of said conversion means at each fulcrum, and calculation means to execute calculations for evaluating the coordinates of the point to which the external force has been applied, the outputs of said subtraction means in accordance with the output of said sensing means.

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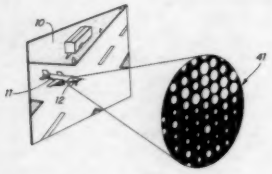
4,389,712

## HIGH INFORMATION DENSITY LASER IMAGE RECORDING METHOD AND APPARATUS

Joseph R Frattarola, Westford; Richard H. Hudgin, Newton, and Theodore R. Yachik, Belmont, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Mar. 9, 1978, Ser. No. 885,057
Int. Cl.[3] G11C *11/42, 13/04*
U.S. Cl. 365—127 16 Claims




1. An optical memory for storing a human readable pictorial image and machine readable digital information with the same format comprising:

a. an optical recording medium;

b. a pictorial image recorded on said optical recording medium, said pictorial image comprising a large number of separate picture elements, each of said picture elements having a specific optical density value such that all of the large number of picture elements taken together will construct said pictorial image; and

c. each of said large number of picture elements comprising a plurality of discrete parts each of which contribute to and which together define a specific digital value for storing said machine readable digital information.

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4,389,713

## DUAL PULSE METHOD OF WRITING AMORPHOUS MEMORY DEVICES

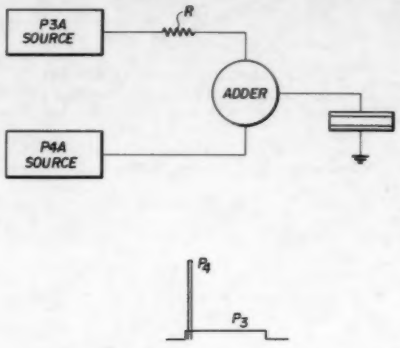
Vipin N. Patel, Melbourne, and Joseph S. Raby, West Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 10, 1981, Ser. No. 272,314
Int. Cl.[3] G11C *11/00*; H01L *45/00*
U.S. Cl. 365—163 10 Claims

5. A method of setting a filament-type memory device including spaced electrodes between which extends a body of high resistance generally amorphous material, a filamentous path of which switches to a low resistance generally crystalline state when a voltage pulse in excess of a given threshold voltage is applied across the electrodes, the method comprising:

applying to said electrodes a first voltage pulse of an amplitude initially sufficient to create across said device a voltage the threshold voltage of the device to switch said device and after switching to create a low amplitude holding current through said device, said first pulse having a first duration sufficient to substantially crystallize said filamentous path; and

applying a second voltage pulse to said electrodes immediately after said device has switched of an amplitude sufficient to create a current through said device sufficient to




drive said filamentous path into the liquid phase for a very short duration.

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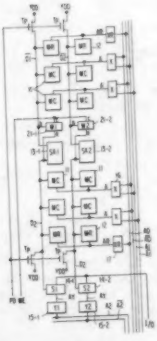
4,389,714

## MEMORY DEVICE

Masumi Nakao, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,275
Claims priority, application Japan, Sep. 20, 1979, 54/121365
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—189 20 Claims

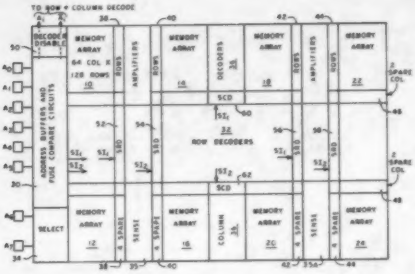


1. A semiconductor memory device comprising a plurality of digit line pairs, each of said digit line pairs including a first digit line and a second digit line, a plurality of memory cells, a plurality of sense amplifiers respectively provided for said digit line pairs and adapted to operatively amplify a potential difference between the first digit line and the second digit line of the associated digit line pair, a bus line, and means for selectively transferring a logic level of the first digit line of one of said digit line pairs to said bus line, and a plurality of drive circuits, each said drive circuit being responsive to a first level of the first digit line of the associated digit line pair for operatively making a potential of the second digit line of said associated digit line pair to a second level, each of said drive circuits including an inverter circuit receiving a signal from the first digit line and switching means responsive to an output of said inverter circuit for operatively feeding a power supply voltage to the second digit line.

## 4,389,715
## REDUNDANCY SCHEME FOR A DYNAMIC RAM

**Sargent S. Eaton, Jr., and David R. Wooten, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.**

**Filed Oct. 6, 1980, Ser. No. 194,613**
**Int. Cl.³ G11C *11/40***
**U.S. Cl. 365—200** **10 Claims**



**8**. In a RAM having main columns of memory cells, a plurality of spare memory cells, a main decoder for accessing the main memory cells, and a spare decoder for accessing the spare memory cells, a redundancy scheme for replacing defective main cells with spare cells without disabling the main decoder, comprising:

a memory array divided into first and second sectors, the first sector containing a portion of each main memory column and one or more spare columns, and the second sector containing the remaining portion of each main memory column and one or more spare columns;

means for accessing the main memory columns and the spare memory columns such that, when a portion of an addressed main column in said first sector is defective and its remaining portion in said second sector is not defective, the non-defective portion of said addressed column is accessed and a spare replacement column in one of said sectors is accessed in place of the defective portion of the addressed column; and

means for coupling the data associated with the accessed portion of the addressed column and the replacement spare column to a data output.

## 4,389,716
## MODE CONTROL SYSTEM FOR A RADIO/TAPE PLAYER UNIT

**Erik W. Pearson, Canoga Park, Calif., assignor to Superscope, Inc., Chatsworth, Calif.**

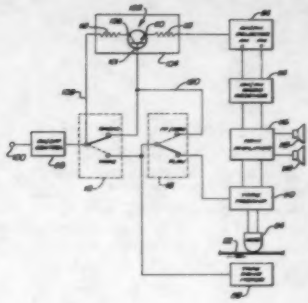
**Filed Apr. 24, 1981, Ser. No. 257,168**
**Int. Cl.³ H04B *1/20, 1/06***
**U.S. Cl. 369—6** **16 Claims**

**1**. In a radio/tape player unit having a radio portion for receiving and converting a radio signal to an audio output, and a tape player portion having drive means for transporting magnetic tape past sensing means for sensing information stored on the tape and for converting the information to an audio output, a system for controlling the mode of operation of the unit, comprising:

a mode selector switch movable between a "radio" mode setting for energization of the radio portion to provide a radio audio output, and a "tape" mode setting for energization of the tape player portion to provide a tape audio output;

means for selectively operating the tape player portion in a fast-forward condition and in a reverse condition for respective rapid advancing and rewinding of the tape past the sensing means; and

a mode override switch responsive to operation of the tape player portion in the fast-forward condition and in the

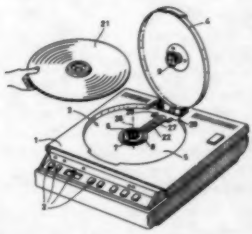


reverse condition to disable the tape audio output and to energize the radio portion to provide a radio audio output.

## 4,389,717
## APPARATUS FOR WRITING AND/OR READING INFORMATION ON A ROTARY INFORMATION DISC WITH THE AID OF A RADIATION BEAM

**Eduard Camerik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 17, 1980, Ser. No. 207,324**
**Claims priority, application Netherlands, Jul. 31, 1980, 8004379**
**Int. Cl.³ G11B *1/00, 7/18***
**U.S. Cl. 369—75** **8 Claims**



**1**. An apparatus for recording and/or reading information in an information surface of an information disc which rotates about an axis of rotation, with the aid of a radiation beam, which apparatus comprises:

a main frame (**1**),

an objective frame (**16**),

an objective (**17**), which is movable relative to the objective frame for concentrating the radiation beam to a radiation spot in a focussing plane and which comprises a lens system with one or more lenses and with an optical axis as well as a free end (**20**) to be directed to the information disc, and

a parallel guide (**19**) for guiding the movements of the objective in the direction of its optical axis,

characterized in

that near the free end (**20**) of the movable objective (**17**) there are arranged stationary plane-parallel radiation-beam transmitting shielding means (**22**), which are connected to the main frame (**1**) transversely of the optical axis (**18**), between the lens system and the location of a rotary information disc (**21**) for shielding the objective from dust, contaminants and mechanical damage, and

that the lens system is corrected for the optical properties of the shielding means.

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**4,389,718**

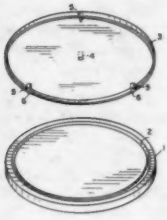
## PHONOGRAPH DECOUPLING APPARATUS AND METHOD

**Frank Rizzello, 85-50 259th St., Floral Park, N.Y. 11004**

**Continuation of Ser. No. 86,997, Oct. 22, 1979, Pat. No. 4,279,423. This application Mar. 16, 1981, Ser. No. 244,305 The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.**

**Int. Cl.³ G11B *3/60***

**U.S. Cl. 369—247** **44 Claims**



1. A record playing apparatus comprising:

a first motor driven, substantially rigid, turntable platter;

a second substantially rigid turntable platter mounted above said motor driven platter with no further platters mounted therebetween, said first and second platters having confronting surface portions, said second platter adapted to receive a record thereon;

a plurality of low compliance small contact area mounting devices, each of said mounting devices comprising a substantially rigid, substantially inelastic protrusion or projection immovably fixed to and rigidly extending from one of said first and second platters toward the other of said platters and each protrusion or projection having a free end portion of given shape;

receiving means on said other of said platters, said receiving means comprising at least one depression for receiving and contacting at at least two substantially opposed points said free end portions of said small contact area mounting devices such that movement of said other platter relative to said free end portions of said small contact area mounting devices is substantially prevented in all directions in parallel with the planes of said platters during operation of the record playing apparatus;

said small contact area mounting devices being spaced from each other and being unconnected with each other, and being distributed around peripheral portions of said confronting surface portions of said first and second platters for providing a plurality of isolated small contact, substantially rigid, support areas directly between said first and second platters and maintaining said confronting surfaces spaced from each other, the total of the cross sectional areas of said small contact area mounting devices being substantially less than the area of said platters in the plane of said platters, said first and second platters being connected with each other only via said small contact area mounting devices; and

a spindle in the central portion of said second platter for engaging a center of a phonograph record, said spindle not extending to said first platter.

**4,389,719**

## OPTICALLY READABLE INFORMATION DISK

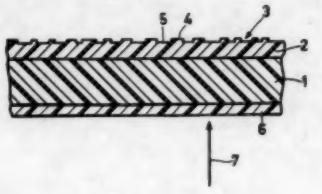
**Michael J. C. Van de Donk; Hendricus C. A. M. Heinemans, and Petrus E. J. Legierse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 8, 1980, Ser. No. 185,052**

**Claims priority, application Netherlands, Apr. 8, 1980, 8002039**

**Int. Cl.³ B32B *15/08***

**U.S. Cl. 369—275** **3 Claims**




1. An optically readable information disk consisting essentially of a transparent substrate plate of polyvinyl chloride or a copolymer of vinyl chloride provided on one side with a reflecting optical structure comprising a radiation cured lacquer layer containing an information track having a crenelated profile of information areas situated alternatively at a higher and a lower level and a reflecting layer located on said radiation cured lacquer layer, said information track being readable by reflective laser light through said substrate plate, and, on the surface of the substrate plate remote from the optical structure a radiation cured lacquer layer transparent to the laser light employed.

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**4,389,720**

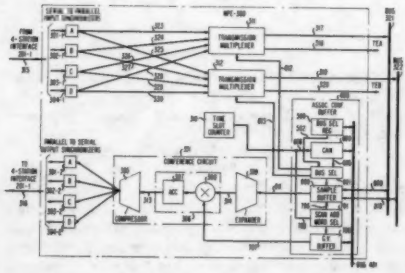
## DISTRIBUTED DIGITAL CONFERENCING SYSTEM

**Leslie A. Baxter, Eatontown; Paul R. Berkowitz, Red Bank, and Clair A. Buzzard, Lincroft, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Apr. 23, 1981, Ser. No. 256,937**

**Int. Cl.³ H04Q *11/04***

**U.S. Cl. 370—62** **10 Claims**



1. A system for providing conference communications among a group of ports served by a common bus, said system characterized by

means for establishing with respect to said common bus a plurality of time slots, each time slot defining a period of time in which a signal sample from any of said ports may be placed on said bus by any port and obtained from said bus by one or more other ports,

a port control circuit associated with each said port, said port control circuit operative for obtaining samples from

said common bus, or for placing samples on said common bus, said port circuit comprising,

means for temporarily storing the identities of the time slots destined for said associated port for the duration of a communication connection,

means for temporarily storing unique gain adjustment values for each said obtained signal sample,

means for modifying said obtained signal samples under control of said assigned gain adjustment values, and

means for providing to said associated port a combined signal sample including all said modified signal samples.

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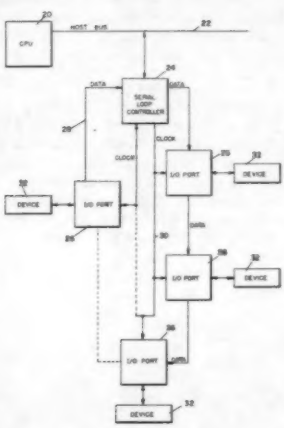
4,389,721

## TIME-DIVISION MULTIPLEX SERIAL LOOP

William R. Young, and Stanley R. Zepp, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 30, 1981, Ser. No. 278,990
Int. Cl.³ H04J 6/02; G08B 5/00
U.S. Cl. 370—88 32 Claims




1. A serial loop comprising:

loop controller means for controlling the transmission of data outbound onto said loop and reception of data inbound onto said loop by generating a plurality of frames, each of which includes a frame control field followed by a fixed number of fixed bit length time slot fields, each time slot field including an inbound data control field, a data field and an outbound data control field; and

a plurality of I/O means connected in a series loop to said loop controller, means, each for receiving said frames, monitoring one of said time slot fields to which the I/O means is dedicated, inserting data into the data field of said dedicated time slot field if so signified by the inbound data control field, and removing data from said data field of said dedicated time slot field if so signified by the outbound data control field.

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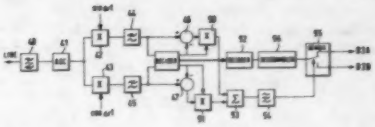
4,389,722

## METHOD FOR THE SIMULTANEOUS TRANSMISSION OF A PLURALITY OF DATA STREAM OVER ONE TRANSMISSION CHANNEL

Hagen Hofmeister, Korb, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,631
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937073
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 16 Claims



1. In a method for simultaneously transmitting a plurality of modulated digital data streams over one transmission channel with the aid of a pair of modems, one of the modems acting as a transmitter and the other of the modems acting as a receiver, and wherein the data streams are modulated at the modem acting as the transmitter, transmitted via the single channel and demodulated at the modem acting as a receiver; the improvement comprising synchronizing the receiver with the specific modulation of the individual data streams of the transmitter by: applying a small additional modulation to the transmitter signal with the frequency of the additional modulation being equal to the modulation rate of the transmitter signal divided by a whole number; demodulating the additional modulation in the receiver by deriving, from actual values of the received modulated signal, associated values corresponding to the received values to be expected in a system without the additional modulation, and multiplying the derived values by the difference between the associated derived and actual received values; freeing the resulting parameter signal of interferences; and using the interference freed parameter signal as the synchronizing signal in the receiver.

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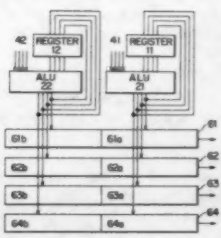
4,389,723

## HIGH-SPEED PATTERN GENERATOR

Atsushi Nigorikawa; Hiroshi Yokoyama, and Takanori Fujieda, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd. and Ando Electric Co., Ltd., both of Tokyo, Japan

Filed Jan. 14, 1981, Ser. No. 224,986
Claims priority, application Japan, Jan. 18, 1980, 55-3487
Int. Cl.³ G01R 31/26
U.S. Cl. 371—27 5 Claims




1. A high-speed pattern generator comprising a plurality of n ($n \geq 2$) of units, said units comprising a plurality of n arithmetic and logic units (hereinafter referred to as "ALUs") having outputs in m bits ($m \geq 1$) and a plurality of n registers having outputs and also having inputs for receiving the outputs from

said ALUs, the outputs of one of (a) said plurality of ALUs and (b) said plurality of registers being the outputs of said units, said generator further comprising a plurality m of n-bit shift registers, said ALUs having inputs for receiving input data and receiving outputs from said registers, said shift registers having inputs connected for receiving the outputs of said units in a manner to supply the outputs of the ith ($n \geq i \geq 1$) unit to ith bit inputs of said shift registers in the same sequence, thereby enabling said shift registers to produce a pattern output.

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**4,389,724**

## ATMOSPHERE CONTROLLED ELECTRIC MELTING

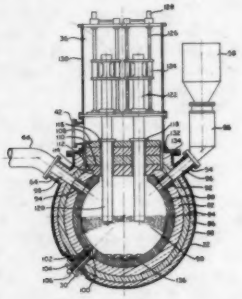
**Patrick J. Wooding, Moorestown, N.J., assignor to Wooding Corporation, Moorestown, N.J.**

**Continuation-in-part of Ser. No. 773,263, Mar. 1, 1977, Pat. No. 4,202,997. This application Feb. 7, 1980, Ser. No. 119,450**

**The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.**

**Int. Cl.³ C03B 5/02**

**U.S. Cl. 373—33** **17 Claims**



1. An electric melting furnace comprising:

a carbon-lined crucible having an upper portion and a lower portion;

means for sealing the interior of said crucible from the atmosphere outside said crucible, said means for sealing including a refractory-lined roof covering said upper portion;

means for controlling the atmosphere within said crucible including means for removing detrimental gases detrimental to the lining therefrom;

means for feeding non-metallic material to be melted into the interior of said crucible including means for preventing atmospheric gases from entering the interior of said crucible while said material is being fed thereto;

electric means for melting the material fed into the crucible, and

taphole means located adjacent the lower portion of said crucible for removing molten material from said crucible while said electric means is melting material within said crucible.

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**4,389,725**

## ELECTRIC BOOSTING CONTROL FOR A GLASS FOREHEARTH

**Marvin L. Barkhau, Elmore; Philip D. Perry, Toledo, both of Ohio, and Roland F. Pimm, Manteca, Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Jul. 27, 1981, Ser. No. 287,382**

**Int. Cl.³ C03B 5/02**

**U.S. Cl. 373—40** **6 Claims**

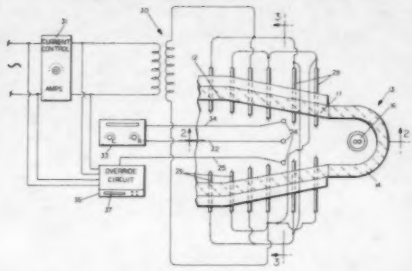
1. Apparatus for heating molten glass flowing through the conditioning section of a forehearth comprising:

a plurality of pairs of electrodes extending through the sidewalls of the forehearth with their ends terminating adjacent the sidewall thereof;

circuit means connected to said electrode pairs, said circuit means being such as to cause joule effect heating of the glass adjacent the sidewalls of the forehearth;

a source of electrical current connected to said circuit means;

a first temperature sensing means positioned within said forehearth at the center line thereof within the conditioning section adjacent the end thereof, said first sensing means including a thermocouple immersed in the glass;



a second temperature sensing means extending into the forehearth adjacent the sidewall thereof in alignment with said first sensing means;

a current controller in said circuit means;

a settable, temperature override circuit connected to said circuit means; and

means connecting said second temperature sensing to said override circuit for adjusting the current to said electrodes to bring the sidewall temperature to the selected set point of said override circuit.

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**4,389,726**

## ADAPTIVE PREDICTING CIRCUIT USING A LATTICE FILTER AND A CORRESPONDING DIFFERENTIAL PCM CODING OR DECODING APPARATUS

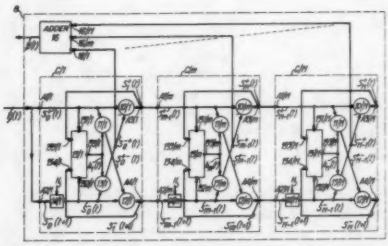
**Alain Le Guyader, 40, Residence Duroux, and Andre Gilloire, 7, rue Yann Peron, both of 22300 Lannion, France**

**Filed Apr. 10, 1981, Ser. No. 253,154**

**Claims priority, application France, Apr. 21, 1980, 80 08883**

**Int. Cl.³ H04B 12/04**

**U.S. Cl. 375—27** **7 Claims**



1. An adaptive predicting circuit comprising:

(A) a lattice filter with N identical cells (C) each having a first access port ($A_1$), a second access port ($A_2$), a third access port ($A_3$) and a fourth access port ($A_4$), the first and second access ports ($A_1/m$, $A_2/m$) of a cell (C/m) of rank m being respectively connected to the third and fourth access ports ($A_3/m-1$, $A_4/m-1$) of the preceding cell (C/m−1) of rank m−1, each cell comprising a circuit (14/m) for delaying sampling time connected to the second access port and circuits of linear combinations of signals appearing at the access ports of the cell, including

first and second multipliers each having first and second inputs, one of said inputs receiving one of the signals and the other of said inputs receiving a multiplication coefficient $k_m(t)$ dependent on the sampling time t, means being provided for supplying said coefficient $k_m(t)$ to the multipliers; and

(B) an adder (16) having N inputs respectively connected to the N cells and an output supplying a prediction signal; wherein the means for supplying the coefficient $k_m(t)$ comprise in each cell a circuit (15/m) for the sequential adaptation of the coefficient $k_m(t)$ inherent to each cell, said adaptation circuit having a first input (151/m), a second input (152/m), a third input (153/m), and a fourth input (154/m), said inputs being respectively connected to the first access port ($A_1$/m) of the cell, to the output of the delay circuit (14/m) and to the third and fourth access ports ($A_3$/m, $A_4$/m) of the cell, said adaptation circuit also having an output (155/m) which supplies the coefficient $k_m(t)$, the N coefficients of the lattice filter being readjusted by the N adaptation circuits for each sampling time from the signals present at this time in the filter, and the coefficients being used immediately after readjustment.

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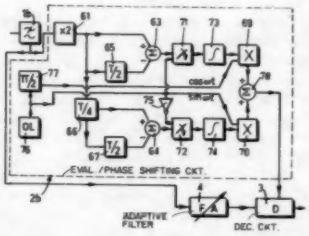
**4,389,727**

## METHOD FOR CONTROLLING THE CLOCK PHASE OF A RECEIVING SYSTEM FOR DIGITAL DATA, PHASE RECOVERY CIRCUIT FOR EFFECTUATING THIS METHOD AND DIGITAL DATA RECEIVING SYSTEM COMPRISING SAID CIRCUIT

**Denis Rouffet, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 23, 1981, Ser. No. 236,942**
**Claims priority, application France, Feb. 27, 1980, 80 04324**
**Int. Cl.³ H04L** *7/04*
**U.S. Cl. 375—110** **5 Claims**




2. A phase recovery circuit for a receiving system for digital data having a symbol period T and being transmitted after linear modulation over a time-varying channel with limited pass-band, characterized in that the phase recovery circuit comprises:

a lowpass filter circuit having a transfer function such that this circuit substantially eliminates the frequencies above 1/T from the received frequency spectrum and the average energy of its output signal, as a function of the time t and the symbol period T of the transmitted data at the input of the channel, is only defined by an expression of the type $E=A+B\cdot\cos(2\pi t/T)$, A and B being two constant or slowly varying positive real coefficients;

an evaluation circuit for determining the phase deviation $\phi_E$ between the value $\phi_M=2\pi t_M/T$ maximizing the expression for E and the value $\phi=2\pi t/T$ corresponding to the value of the average energy of the output signal of the filter circuit at a sampling instant t preceding the clock phase control; and

a phase shifting circuit for shifting the sampling instants fixed by the clock over a time $t_E=(\phi-\phi_M)T/(2\pi)$, taking its sign into consideration.

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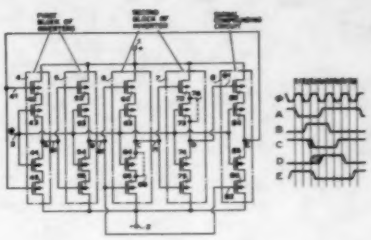
**4,389,728**

## FREQUENCY DIVIDER

**Akira Tsuzuki, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Dec. 23, 1980, Ser. No. 219,237**
**Claims priority, application Japan, Dec. 29, 1979, 54-172181**
**Int. Cl.³ H03K** *21/10, 23/22*
**U.S. Cl. 377—114** **4 Claims**




1. A frequency divider comprising a first block composed of an even number of stages of clock controlled inverters connected in cascade and operative to propagate the change of state of an input signal in synchronism with the change of a clock signal; a second block composed of an even number of stages of clock controlled inverters connected in cascade and operative to propagate the change of state of the input signal from a first electric source line potential to a second electric source line potential in synchronism with the change of the clock signal; and a clock controlled signal compounding circuit having first and second input terminals operative to change the output state in synchronism with the change of the clock signal when the state of the first input terminal is changed from the first electric source line potential to the second electric source line potential and when the state of the second input terminal is changed from the second electric source line potential to the first electric source line potential; the final stage output terminal of the first block being connected to the initial stage input terminal of the second block and to the second input terminal of said clock controlled signal compounding circuit, the final stage output terminal of the second block being connected to said first input terminal; and the output terminal of said signal compounding circuit being connected to the initial input terminal of the first block.

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**4,389,729**

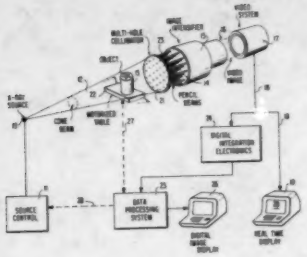
## HIGH RESOLUTION DIGITAL RADIOGRAPHY SYSTEM

**Jay Stein, Framingham, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.**

**Filed Dec. 15, 1981, Ser. No. 331,100**
**Int. Cl.³ G01N** *23/04;* **H05G** *1/60*
**U.S. Cl. 378—99** **14 Claims**

12. In a fluoroscopic system of the type comprising an X-ray source located on one side of an object to be examined, an image intensifier tube located on the other side of said object, and a video system for scanning an image generated on an output face of said tube for producing analog signals representative of said image, the improvement comprising collimator means located between said X-ray source and said image intensifier tube, said collimator means having a two-dimensional array of spaced holes therein for directing a corresponding array of pencil beams of X-rays toward the input face of the image intensifier tube, means for raster scanning said pencil beams relative to said object and across said input face through distances substantially corresponding to the distances between the spaced holes in said collimator means while said video system is scanning the images that are generated on the output

face of said tube, means for digitizing the analog signals produced by said video system, and means for interleaving a series



of said digitized signals to provide a composite digital signal representative of a high resolution image of said object.

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**4,389,730**

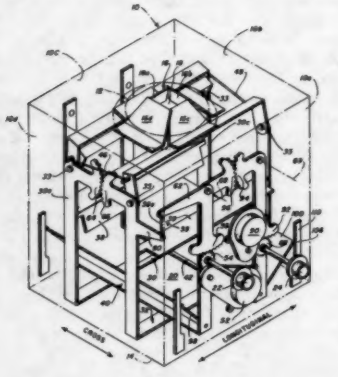
**COMPACT COLLIMATOR**

**James Cutter, Hollister, Calif., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.**

**Filed May 14, 1981, Ser. No. 263,448**

**Int. Cl.³ G21F *5/04*; G21K *1/04***

**U.S. Cl. 378—153** **7 Claims**



1. An x-ray collimator adapted for mounting to an x-ray source to adjustably define the longitudinal and transverse boundaries of radiation which emerges from the source in a direction generally orthogonal to both the longitudinal and transverse directions and comprising:

a housing having an inlet port and an outlet port aligned therewith;

a first shutter assembly including a first pair of transversely narrow, longitudinally extending, x-ray absorbing shutter elements adjacent the outlet port and supported for opposing rotational movement about respective longitudinally extending axes adjacent the inlet port, the first shutter element pair having respective transversely inner, longitudinally extending edge portions which define the transverse radiation boundaries;

a second shutter assembly including a second pair of transversely extending, x-ray absorbing shutter elements oppositely adjacent the first pair with respect to the outlet port and supported for opposing rotational movement about respective transversely-extending axes adjacent the inlet port, the second pair of shutter elements having respective, longitudinally inner, transversely extending inner edge portions which define the longitudinal radiation boundaries and further include respective x-ray blocking surfaces extending longitudinally outward from the edge portions towards longitudinally-outward ends thereof;

guide means for opposingly rotating the outer ends of the blocking surfaces about the inner ends thereof as the second pair of shutter elements are rotated;

first means for opposingly rotating the first pair of shutter elements; and

second means for opposingly rotating the second pair of shutter elements.

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**4,389,731**

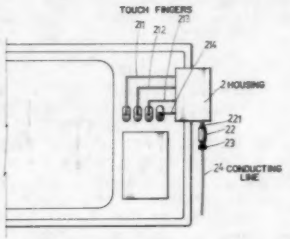
**REMOTE CONTROL DEVICE FOR TOUCH TYPE TUNER OF TELEVISION**

**Ta-She Wu, No. 42, Feng-Chia St., Tainan, Taiwan**

**Filed Apr. 17, 1981, Ser. No. 254,849**

**Int. Cl.³ H03J *9/00*; H04B *1/06***

**U.S. Cl. 455—153** **9 Claims**




1. A remote control device for a touch type tuner of a television comprising:

a remote control box including a plurality of pressing means for selectively providing pressed air through individual ones of a respective plurality of outlets;

a touch control mechanism including a plurality of bellow members, each being received in a respective cavity provided on the inner wall of the rearmost end of a housing, each said bellow member having an inlet at one end thereof communicating with one of said plurality of outlets through a respective tube, another end of each of said bellow members capable of biasing a respective movable body forwards when each said bellow member expands;

a plurality of electrically conducting touch fingers, each conducting touch finger having one end thereof abutting against a respective touch button of the tuner, and the other end thereof fixed insulatedly at the inner wall of the foremost end of the housing; and

a potential conducting line electrically coupled to a plurality of electrically conductive tongues, each said tongue mechanically contacting a free end of a respective one of said movable bodies such that as the pressed air expands a respective bellow member, its associated movable body is subsequently biased to cause its respective tongue to contact with a respective conducting touch finger to achieve a selection operation.

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**4,389,732**

**TUNING DEVICE FOR RADIO RECEIVER**

**Yasumasa Sasahara, and Hiroshi Kuroda, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Oct. 2, 1980, Ser. No. 193,111**

**Claims priority, application Japan, Oct. 3, 1979, 54-127737; Oct. 3, 1979, 54-127738**

**Int. Cl.³ H04B *1/16*; H03J *7/30***

**U.S. Cl. 455—160** **15 Claims**

1. A tuning device for a radio receiver capable of selectively

carrying out automatic and manual tuning operations, comprising:

a variable tuning element for determining a tuning frequency of the receiver;

a manipulator for manually operating said tuning element in the manual operation;

a motor for operating said tuning element in the automatic operation;

clutch means for selectively transmitting to the tuning element an operating force for said element from either one of said manipulator and said motor;

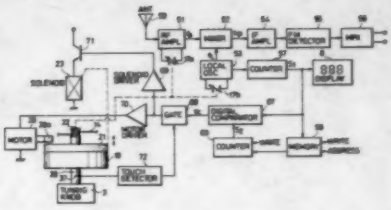
first operating force transmitting means to transmit the operating force from said manipulator to said clutch means;

second operating force transmitting means independently operated relative to said first transmitting means to transmit the operating force from said motor to said clutch means; and

clutch control means to control said clutch means to couple to said tuning element said first transmitting means in the manual operation or said second transmitting means in the automatic operation;

wherein said clutch means comprises

a rotatable clutch plate adapted to selectively receive an operating force from either said first or second transmitting means, and



clutch driving means for driving said clutch plate to receive one of said operating forces.

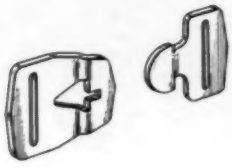
# DESIGN PATENTS

## GRANTED JUN. 21, 1983

### ERRATA

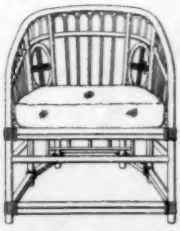
| For CLASS | See PATENT NO. |
|---|---|
| D18–008 | 269,403 |
| D21–045 | 269,447 |

269,389
BUCKLE FOR SAFETY BELT OR HARNESS
Kenneth H. Wood, 152 New St., Brighton, Victoria, 3186, Australia
Filed Jul. 17, 1980, Ser. No. 169,730
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—408

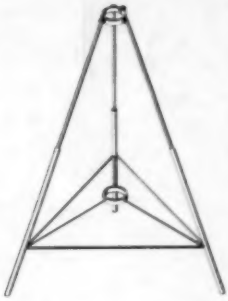


269,390
TOY ROCKING CHAIR
Juliet Holmes a Court, Woollahra, Australia, assignor to Freeflight International Pty. Limited, Sydney, Australia
Filed Dec. 10, 1980, Ser. No. 214,935
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—11

269,391
CHAIR
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Jun. 2, 1980, Ser. No. 155,404
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—57



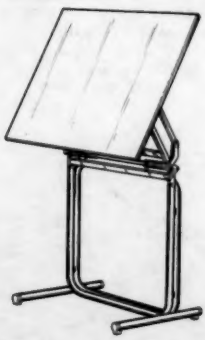
269,392
TREE STAND
John J. Breen, 7100 Alcove Ave., North Hollywood, Calif. 91605
Filed Mar. 6, 1981, Ser. No. 241,463
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—105



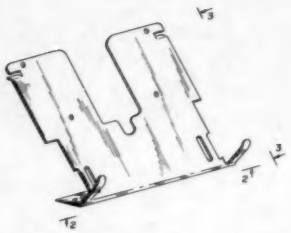
269,393
BOOT HOLDER
Jorgen Larsen, 4772 - 238 St., Langley, British Columbia, Canada (V3A 4P1), and Thor Heske, 24095 - 25 Ave., Aldergrove, British Columbia, Canada (V0X 1A0)
Filed Feb. 17, 1981, Ser. No. 235,108
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—116

269,394
GUN SECURITY CABINET
Thomas W. Hennessey, 20215 Akin Rd., Farmington, Minn. 55024
Filed Mar. 16, 1981, Ser. No. 244,224
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167

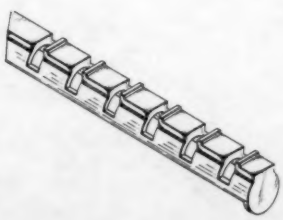
269,395
ADJUSTABLE TABLE
Dennis R. Kapp, 7780 Chichester, Canton, Mich. 48187
Filed May 4, 1981, Ser. No. 260,080
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



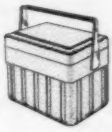
269,396
SUPPORT CADDY FOR TOOLS OR THE LIKE
Stewart J. Bricker, 3373 Mary Ave., Columbus, Ohio 43204
Filed Feb. 5, 1981, Ser. No. 231,905
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—180

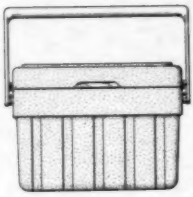


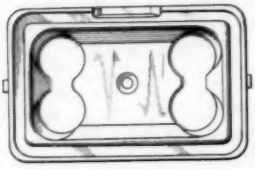
269,397
ARM EXTENSION FOR A RUG SAMPLE DISPLAY STAND
Fred Van Duyne, Ringwood, N.J., assignor to Melrose Displays, Inc., Passaic, N.J.
Filed Dec. 22, 1980, Ser. No. 218,648
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191



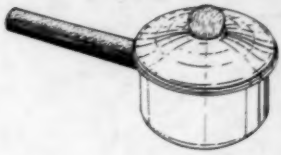
269,398
INSULATED CONTAINER
Craig Ruxton, Harris County, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Sep. 10, 1980, Ser. No. 186,054
The portion of the term of this patent subsequent to May 17, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D07—*07*
U.S. Cl. D7—77

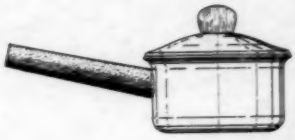


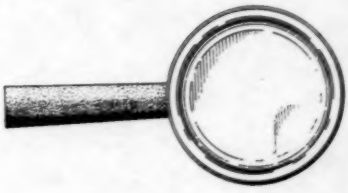




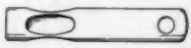
269,399
COVERED SAUCEPAN
Yanta H. T. Lam, Hong Kong, Hong Kong, assignor to Meyer Manufacturing Co. Ltd., Hong Kong
Filed Sep. 29, 1980, Ser. No. 192,114
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—361



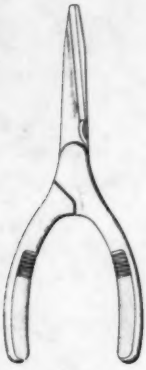




269,400
HANDLE FOR KITCHEN TOOLS, UTENSILS OR THE LIKE
Fredrich W. Usbeck, Frauenstrasse 33, D-3550 Marburg, Lahn, Fed. Rep. of Germany
Division of Ser. No. 26,612, Apr. 3, 1979, Pat. No. Des. 263,920.
This application Sep. 11, 1981, Ser. No. 301,244
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 16 MR 278; Feb. 9, 1979, 16 MR 286; Feb. 21, 1979, 16 MR 287
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—395



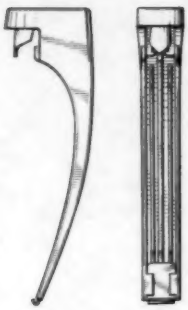
269,401
GARDEN SHEARS
Alan K. Pittaway, High Wycombe, England, assignor to Wilkinson Sword, Limited, England
Filed Jul. 28, 1981, Ser. No. 287,604
Claims priority, application United Kingdom, Jan. 31, 1981, 998684; Jan. 31, 1981, 998685
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—5



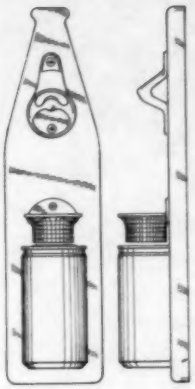
269,402
GARDENING TOOL
Theodore A. Wayman, Youngstown, Ohio, assignor to M and W Electric Manufacturing Co., East Palestine, Ohio
Filed Aug. 3, 1981, Ser. No. 289,216
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—10

269,403
SHOVEL BLADE
Masao Miyata, No. 2,1-chome, 9-jyo, Kikusui, Shiraishi-ku, Sapporo, Japan
Filed Sep. 14, 1981, Ser. No. 302,126
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D10—8

269,404
COMBINED CAN HANDLE AND OPENER
Robert A. De Mars, 7328 Alabama Ave., Canoga Park, Calif. 91303
Continuation-in-part of Ser. No. 240,131, Mar. 3, 1981. This application Feb. 12, 1982, Ser. No. 348,343
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—34



269,405
COMBINED WALL MOUNTED BOTTLE OPENER AND CAP RECEPTACLE
John T. Ehrlich, 1001 SE. Division, Portland, Oreg. 97214
Filed Apr. 30, 1981, Ser. No. 258,895
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—37



269,406
LOG SPLITTER
Anthony M. Tremaglio, 184 Maybrook Rd., Waterbury, Conn. 06708, and Philip Kaye, 35 Turkey Hill, N., Westport, Conn. 06880
Filed Feb. 19, 1981, Ser. No. 235,850
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—47

269,407

**MOUNTING TOOL FOR WALL EXPANSION ANCHORS**

Jan B. H. Ekener, Täby, Sweden, assignor to Jan Ekener AB, Stockholm, Sweden

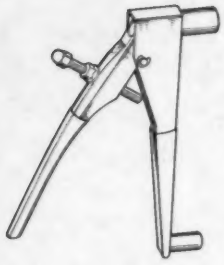
Filed Dec. 11, 1980, Ser. No. 215,466

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, URA 649/80

Term of patent 14 years

Int. Cl. D8—*05*

U.S. Cl. D8—52



269,408

**CYCLE HAND GRIP**

Willard Merritt, Wheaton, Ill., assignor to Oury Grip Grip U.S.A., Inc., Wheaton, Ill.

Filed Jul. 20, 1981, Ser. No. 285,143

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D8—303

269,409

**KNOB**

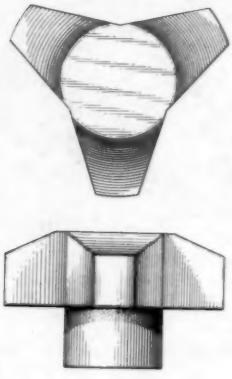
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Aug. 19, 1981, Ser. No. 294,404

Term of patent 14 years

Int. Cl. D8—*06*

U.S. Cl. D8—307



269,410

**THIMBLE FOR A ROPE**

Bengt Johansson, Kullavägen 7, Sjömarken, Sweden (510 41)

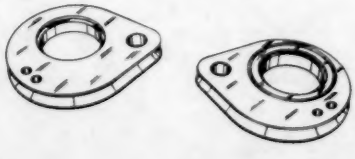
Filed Jun. 8, 1981, Ser. No. 271,688

Claims priority, application United Kingdom, Dec. 9, 1980, 997977

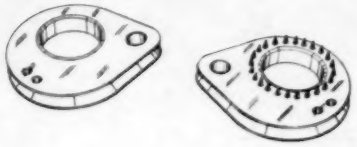
Term of patent 14 years

Int. Cl. D08—*08*

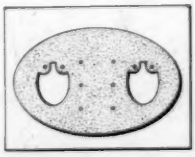
U.S. Cl. D8—367



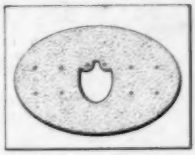
269,411
THIMBLE FOR A ROPE
Bengt Johansson, Kullavägen 7, Sjömarken, Sweden (510 41)
Filed Jun. 8, 1981, Ser. No. 271,689
Claims priority, application United Kingdom, Dec. 9, 1980, 997976
Term of patent 14 years
Int. Cl. D08—*08*
U.S. Cl. D8—367



269,412
JEWELRY DISPLAY CARD
Bruce S. Jeremiah, 387 Charles St., Providence, R.I. 02904
Filed Apr. 27, 1981, Ser. No. 257,909
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—457

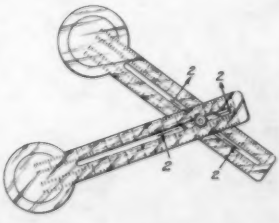


269,413
JEWELRY DISPLAY CARD
Bruce S. Jeremiah, 387 Charles St., Providence, R.I. 02904
Filed Apr. 27, 1981, Ser. No. 257,910
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—457

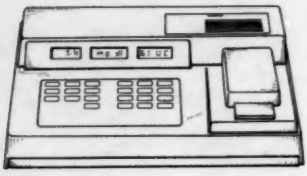


269,414
POCKET CLOCK
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1981, Ser. No. 230,048
Claims priority, application Japan, Jul. 30, 1980, 55-30929
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—18

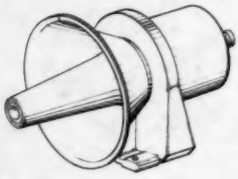
269,415
PILOT TRIANGULATION SCALE
Reginald G. Paton, 2490 Mammoth Dr., San Diego, Calif. 92123
Filed Nov. 6, 1980, Ser. No. 204,489
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



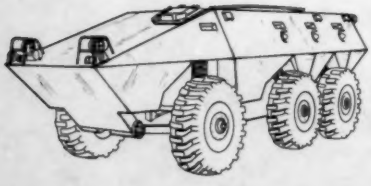
269,416
PHOTOMETER
Erich Retzer, Maisach, and Gerhard Schwarz, Munich, both of Fed. Rep. of Germany, assignors to Compur-Electronic GmbH, Munich, Fed. Rep. of Germany
Filed May 7, 1981, Ser. No. 261,340
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 12 384
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81



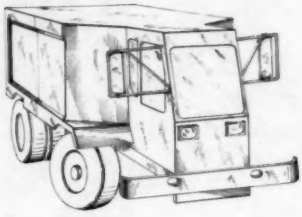
269,417
SIREN
Yoshishige Shintaku, Osaka, Japan, assignor to Ibuki Kogyo Co., Ltd., Osaka, Japan
Filed Sep. 8, 1980, Ser. No. 185,133
Claims priority, application Japan, Apr. 11, 1980, 55-14336
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—120



269,418
SIX-WHEEL ARMORED VEHICLE
Irving Appelblatt, West Bloomfield, and Peter Krawiecki, Utica, both of Mich., assignors to Cadillac Gage Company, Warren, Mich.
Filed Aug. 28, 1980, Ser. No. 182,273
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



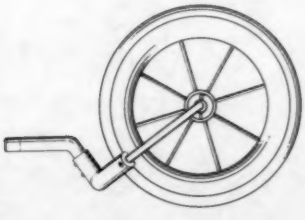
269,419
TRUCK
Thomas J. Umlauf, Hales Corners, and Robert J. Reese, Wauwatosa, both of Wis., assignors to Central Engineering Co., Inc., Milwaukee, Wis.
Filed Sep. 30, 1980, Ser. No. 192,532
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—96



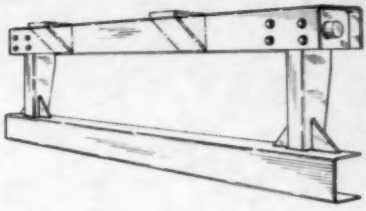
269,420
BOAT AND UTILITY TRAILER STAND OR THE LIKE
Joseph C. McClure, Jr., 38 Park Terrace Dr., St. Augustine, Fla. 32084
Filed Dec. 12, 1980, Ser. No. 215,878
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—106

269,421
BABY CARRIAGE
Kenzou Kasai, Osaka, Japan, assignor to Kasai Kabushiki Kaisha, Osaka, Japan
Filed Jul. 24, 1980, Ser. No. 171,996
Claims priority, application Japan, Jan. 29, 1980, 55-2658; Feb. 13, 1980, 55-5197; Feb. 13, 1980, 55-5199
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

269,422
WHEEL SHOCK ABSORBER
Lawrence A. Mulholland, 416 Mara St., Ventura, Calif. 93004
Filed Feb. 23, 1981, Ser. No. 236,665
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—159

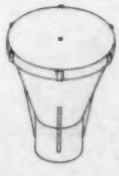


269,423
VEHICLE IMPACT ABSORBER
William Waite, Darlaston, England, assignor to Rubery Owen Holdings Limited, Wednesbury, England
Filed Jul. 24, 1980, Ser. No. 171,952
Claims priority, application United Kingdom, Jan. 31, 1980, 993 400
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



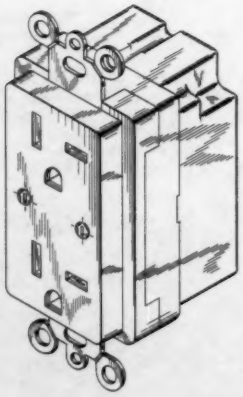
269,424
CALIPER BRAKE FOR BICYCLES
Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Osaka, Japan
Filed Aug. 24, 1981, Ser. No. 290,673
Claims priority, application Japan, Feb. 26, 1981, 56-28288
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—179

269,425
COMBINED GAS CAP AND FUNNEL
John B. Whitaker, Jr., Rte. 4, Box 898, Wetumpka, Ala. 36092
Filed Jan. 16, 1981, Ser. No. 225,617
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—197

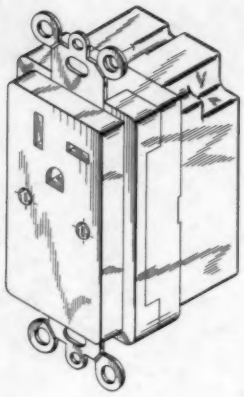


269,426
ELECTRIC POWER DISTRIBUTION UNIT OR SIMILAR ARTICLE
Larry J. Pyle, Second and Gilman Sts., Berkeley, Calif. 94720
Filed Jan. 12, 1981, Ser. No. 224,332
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

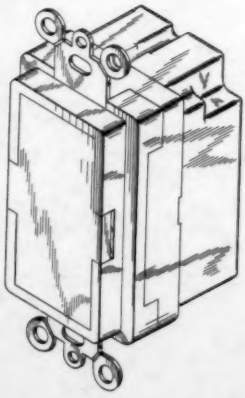
269,427
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,339
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



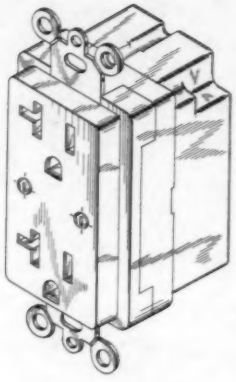
269,428
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,340
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



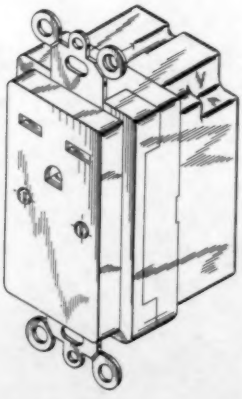
269,429
ELECTRONIC RECEPTACLE HOUSING
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,353
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



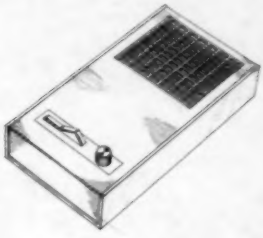
269,430
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,538
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



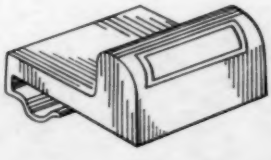
269,431
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,540
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



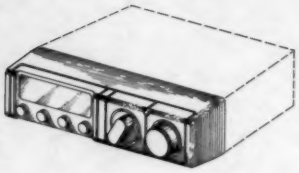
269,432
HOUSING FOR A TELEPHONE AMPLIFIER
John Kowalik, Jr., Freehold; Ronald Longhitano, Matawan, both of N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jul. 7, 1980, Ser. No. 166,099
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

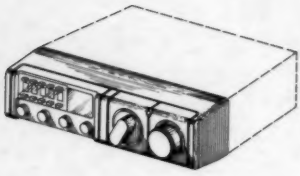


269,433
AUXILIARY TELEPHONE CRADLE
Jeffrey D. Stein, and George A. Saer, both of 3528 Merrimac Ave., San Diego, Calif. 92117
Filed Feb. 17, 1981, Ser. No. 234,991
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

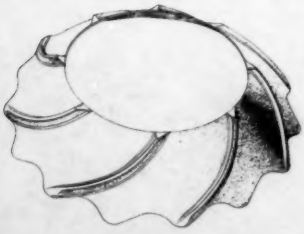


269,434
CONTROL UNIT FOR A VEHICULAR TWO-WAY FM RADIO OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 31, 1981, Ser. No. 249,527
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—76

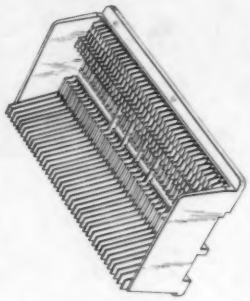




269,435
SKIRT FOR AGRICULTURAL MACHINES FOR MOVING FODDER
Pierre Kaetzel, Saverne, France, assignor to Belrecolt S.A., Marmoutier, France
Filed Apr. 24, 1980, Ser. No. 143,294
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—10

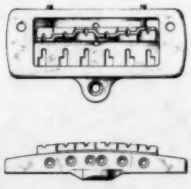


269,436
SLIDE PROJECTOR MAGAZINE
Jochen Jost, Essen, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Aug. 12, 1980, Ser. No. 178,701
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 5MR578
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—26

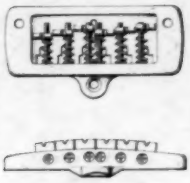


269,437
ELECTRIC GUITAR
Gregg Wilson, Aurora, Colo., and John F. Page, La Mirada, Calif., assignors to CBS Inc., New York, N.Y.
Filed Jun. 10, 1981, Ser. No. 272,310
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

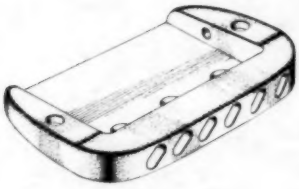
269,438
GUITAR BRIDGE
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed May 22, 1981, Ser. No. 266,294
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



269,439
GUITAR BRIDGE
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed May 22, 1981, Ser. No. 266,295
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



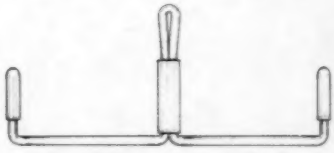
269,440
GUITAR BRIDGE
C. Leo Fender, 1510 Dana Pl., Fullerton, Calif. 92635
Filed May 26, 1981, Ser. No. 266,822
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



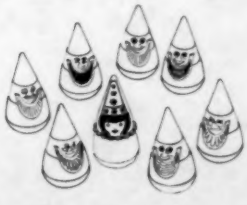
269,441
ELECTRONIC CASH REGISTER
Shuya Matsuda, and Yoshinori Kakiuchi, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 25, 1981, Ser. No. 237,980
Claims priority, application Japan, Nov. 28, 1980, 55-49598
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—4

269,442
ELECTRONIC TRANSLATOR
Iwao Nakajima, Ikoma, and Kazumasa Takenaka, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan
Filed Jun. 9, 1980, Ser. No. 157,787
Claims priority, application Japan, Dec. 20, 1979, 54-53712
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

269,443
PAGE HOLDER FOR AN OPEN BOOK
Theodore L. Million, 793 Cambridge Dr., Santa Barbara, Calif. 93111
Filed Apr. 13, 1981, Ser. No. 253,174
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—34

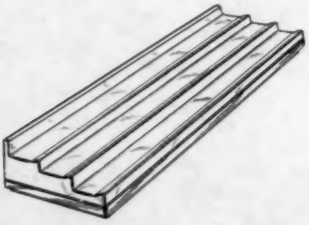


269,444
SET OF FELT PENS
Jürgen Medebach, Kandern-Holzen, Fed. Rep. of Germany, assignor to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Mar. 31, 1980, Ser. No. 135,714
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 82 MR 2308
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

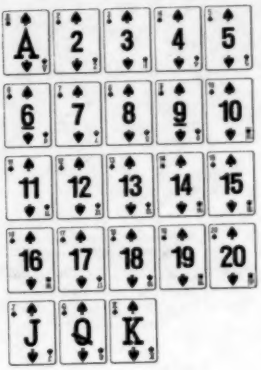


269,445
WRITING INSTRUMENT
Peter A. Krückel, Heroldsberg, and Gerhard Möck, Kirchehrenbach, both of Fed. Rep. of Germany, assignors to Messrs. Schwan-Stabilo Schwanhäusser GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Jul. 13, 1981, Ser. No. 283,053
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, MR VI 484
Term of patent 14 years
Int. Cl. D19—*00*
U.S. Cl. D19—48

269,446
DESK TRAY FOR STATIONERY ARTICLES
Rino Pirovano, Piazza Castello, 11, Milan, Italy
Filed Aug. 22, 1980, Ser. No. 180,495
Claims priority, application Italy, Mar. 24, 1980, 21267/80[U]
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

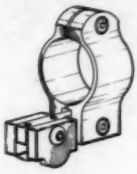


269,447
DECK OF PLAYING CARDS
Bill J. Raheb, 38 Briarwood Dr., Matawan, N.J. 07747
Filed Mar. 26, 1981, Ser. No. 247,870
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—45

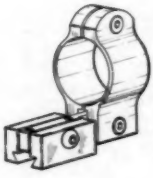



269,448
MODEL SKULL
Bryan Fisher, Flat 21, 43 Wells St., London W1, and Richard J. Miller, 62 Abbott Ave., Wimbledon, London SW20, both of England
Filed Oct. 27, 1980, Ser. No. 200,672
Claims priority, application United Kingdom, May 9, 1980, 994815
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

269,449
SCOPE MOUNT FOR A RIFLE
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Mar. 4, 1981, Ser. No. 240,587
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7



269,450
SCOPE MOUNT FOR A RIFLE
Daniel L. Bechtel, P.P. Box 11281, Fort Worth, Tex. 76109
Filed Mar. 4, 1981, Ser. No. 240,588
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7

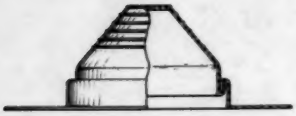


269,451
FOUNTAIN FIREWORK
Zack Treadway, 115 W. 5th, Cordell, Okla. 73632
Filed Jan. 12, 1981, Ser. No. 224,272
Term of patent 14 years
Int. Cl. D22—*03*
U.S. Cl. D22—10

269,452
FISHING REEL
Robert W. Fee, Wichita, and Richard J. Robbins, Derby, both of Kans., assignors to Brunswick Corporation, Skokie, Ill.
Filed May 27, 1981, Ser. No. 267,569
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

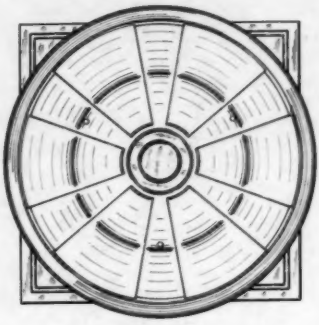
269,453
GARDEN POND FILTER
Waldemar Riepe, Osnabrück, Fed. Rep. of Germany, assignor to Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH, Melle, Fed. Rep. of Germany
Filed Jun. 19, 1980, Ser. No. 161,107
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 9 MR 589
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

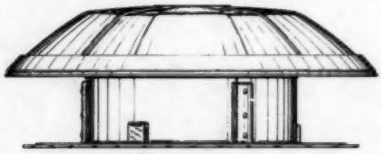
269,454
**SEAL FOR A ROOF VENT PIPE OR SIMILAR ARTICLE**
David G. Houseman, Bayswater, Australia, assignor to John Deks Australia Pty., Ltd., Baywater, Australia
Filed Jan. 27, 1981, Ser. No. 228,955
Claims priority, application Australia, Jul. 28, 1980, 81,633
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



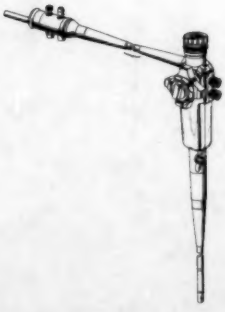
269,455
**DOMESTIC INCINERATOR APPARATUS**
Harry Green, R.D. #2- Outlet Rd., Shortsville, N.Y. 14548
Filed Dec. 11, 1980, Ser. No. 215,287
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—85

269,456
**ROOF VENTILATOR**
Bernard A. McDermott, Akron, Ohio, assignor to Questor Corporation, Tampa, Fla.
Filed Jan. 21, 1981, Ser. No. 226,931
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



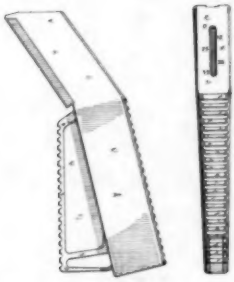


269,457
**ENDOSCOPE**
Koichiro Ishiwara, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Dec. 24, 1980, Ser. No. 220,164
Claims priority, application Japan, Jul. 21, 1980, 55-29633
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—18

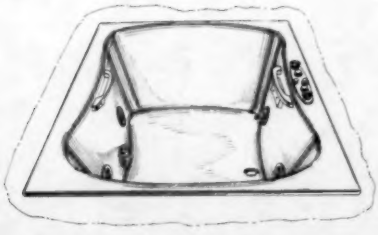


269,458
INCISION APPROXIMATOR
Richard L. Shaffner, 1640 Damon Ct., Dunwoody, Ga. 30338
Filed Dec. 1, 1980, Ser. No. 211,748
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

269,459
SURGICAL STAPLING INSTRUMENT
Reinhart Butter, Columbus, Ohio, and Lehmann K. Li, Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 6, 1980, Ser. No. 194,711
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



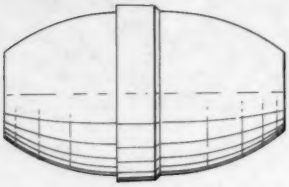
269,460
WHIRLPOOL BATH TUB
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Mar. 25, 1981, Ser. No. 247,507
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38



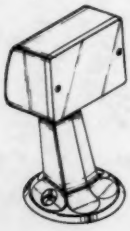
269,461
PACIFIER
Robert L. Qually, 2238 Central St., Evanston, Ill. 60201
Filed Dec. 18, 1980, Ser. No. 217,955
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45

269,462
PACIFIER
Robert L. Qually, 2238 Central St., Evanston, Ill. 60201
Filed Dec. 18, 1980, Ser. No. 217,957
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45

269,463
CONTAINER FOR A MEDICINAL INHALER
David M. Young, Loughborough, England, assignor to Fisons Limited, London, England
Filed Jun. 1, 1979, Ser. No. 44,706
Claims priority, application United Kingdom, Dec. 8, 1978, 987 602
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—62



269,464
LAMP FOR VEHICLES
Italo Caroli, Westmount, Canada, assignor to DBM Reflex Enterprises, Inc., Montreal, Canada
Filed Jan. 29, 1981, Ser. No. 229,364
Claims priority, application Canada, Dec. 2, 1980, 02-12-80-1
Term of patent 14 years
Int. Cl. D26—*06, 05*
U.S. Cl. D26—28



269,465
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael T. Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Sociedad de Dispositivos Reductores de Tabaco, S.A., Spain, a part interest to each
Filed May 4, 1981, Ser. No. 260,197
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

269,466
RAZOR
Kurt Gruber, Solingen, Fed. Rep. of Germany, assignor to Wilkinson Sword Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany
Filed Jan. 6, 1982, Ser. No. 337,524
Claims priority, application United Kingdom, Jul. 14, 1981, 1 001 473
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

*269,467*

**HOT WAX EPILATION CONSOLE**

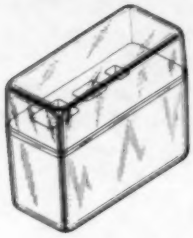
Samuel J. Mann, Englewood, N.J., assignor to Inverness International Corporation, River Edge, N.J.

Filed Jan. 29, 1982, Ser. No. 344,136

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—73



*269,468*

**BIRD HOUSE**

Lowell C. Babcock, Marengo, and Duane L. Schultz, Hampshire, both of Ill., assignors to Custom Packaging Co. Inc., Hampshire, Ill.

Filed Aug. 6, 1980, Ser. No. 175,642

Term of patent 14 years

Int. Cl. D30—*02*

U.S. Cl. D30—3

*269,469*

**BIRD CAGE**

Marcus W. Rankin, P.O. Box 32275, Washington, D.C. 20007

Filed Jul. 21, 1981, Ser. No. 285,459

Term of patent 14 years

Int. Cl. D30—*02*

U.S. Cl. D30—4

*269,470*

**CLEANER MAIN BODY OR THE LIKE**

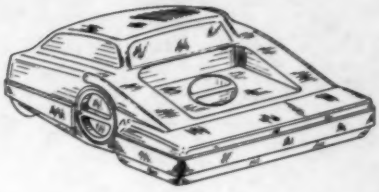
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Nov. 6, 1980, Ser. No. 204,466

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D32—32



*269,471*

**GARBAGE DISPOSAL PLUNGER**

Frederick F. Auerbach, 2660 E. Parley's Way, Salt Lake City, Utah 84109

Filed Sep. 12, 1980, Ser. No. 186,522

Term of patent 14 years

Int. Cl. D7—*05*

U.S. Cl. D32—35

*269,472*

**GOLF CLUB BAG CARRIER FOR A MOTORIZED GOLF CART**

Michael J. Avis, 5212 W. 104th St., Overland Park, Kans. 66207

Filed Oct. 3, 1980, Ser. No. 193,732

Term of patent 14 years

Int. Cl. D12—*02*

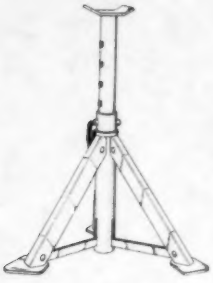
U.S. Cl. D34—15

269,473

**COLLAPSIBLE JACK FOR AUTOMOBILES AND THE LIKE**

Leif Jönsson, Box 4036, 311 04 Falkenberg, Sweden

Filed Jul. 9, 1980, Ser. No. 167,372
Claims priority, application Sweden, Jan. 9, 1980, 80-0043
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—31



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 21ST DAY OF JUNE, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O, Inc.: *See*—
Gallagher, Edward L., 4,389,635, Cl. 340-287.000.

AB Vretstorp-Verken: *See*—
Stenlund, Rune, 4,389,150, Cl. 414-505.000.

Abbott Laboratories: *See*—
Genese, Joseph N., 4,389,210, Cl. 604-177.000.
Plattner, Jacob J., 4,389,416, Cl. 424-309.000.

ABC Sunray Corporation: *See*—
Kamath, Bola R., 4,389,188, Cl. 431-284.000.

Abe, Matazo: *See*—
Tabuchi, Takeshi; and Abe, Matazo, 4,389,484, Cl. 435-144.000.

Abe, Yoshihiro: *See*—
Ogata, Yoshihiro; and Abe, Yoshihiro, 4,389,112, Cl. 355-3.0TR.

Abel, Heinz: *See*—
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,389,214, Cl. 8-527.000.

Abiko, Toshio; and Matsuo, Masayuki, to Matsushita Electric Works, Ltd. Asynchronous type multichannel signal processing system. 4,389,644, Cl. 340-825.520.

Abou-Ezzeddine, Youssef. Apparatus and method for forming concrete blocks, panels and the like. 4,389,036, Cl. 249-120.000.

Absher, Charles A. Tractor scoop mechanism. 4,389,155, Cl. 414-723.000.

Acme Engineering & Manufacturing Corporation: *See*—
Bohanon, Hoy R., Sr., 4,389,352, Cl. 261-106.000.

Acorn Corrugated Box Co.: *See*—
Oberst, Steven M., 4,389,133, Cl. 403-230.000.

Acushnet Company: *See*—
Kudriavetz, Peter, 4,389,365, Cl. 264-297.800.

Adachi, Masakazu, to Otsuka Pharmaceutical Co., Ltd. Determination of tumor associated glycolinkage and diagnosis of cancers. 4,389,392, Cl. 424-1.000.

Adachi, Ryuichi; Yamada, Isao; and Takeshita, Kazuhiro, to Osaka Vacuum Chemical Co., Ltd. Sputtering device. 4,389,299, Cl. 204-298.000.

Adams, Karen M.: *See*—
Gandhi, Haren S.; and Adams, Karen M., 4,389,382, Cl. 423-213.500.

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Adie, John F.: *See*—
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Gockler, Heinz; and Hofmeister, Hagen, 4,389,616, Cl. 329-104.000.

Aeroquip GmbH: *See*—
Steuerwald, Alfred, 4,388,947, Cl. 137-614.060.

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Tanguy, Bernard; Soubeyroux, Jean-Louis; Pezat, Michel; Portier, Josik; and Hagenmuller, Paul, 4,389,326, Cl. 252-188.260.

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Kawamura, Yoshio, 4,389,186, Cl. 431-173.000.

Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, to FMC Corporation. Trialkylamine/sulfur dioxide catalyzed sulfenylation of carbamates. 4,389,528, Cl. 549-470.000.

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Neuhaus, Karl-Friedrich; Rosenkranz, Hans J.; and Perrey, Hermann, 4,389,472, Cl. 430-10.000.

AGFA-Gevaert N.V.: *See*—
Deconinck, Hugo F., 4,388,992, Cl. 206-455.000.

Agrico Chemical Company: *See*—
Parks, Kenneth L., 4,389,380, Cl. 423-167.000.

Ahlers, Egon, to Seitz-Werke GmbH. Rotating single or multi-chamber counterpressure filling machines. 4,388,954, Cl. 141-39.000.

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Aihara, Toshiharu, to Hitachi Denshi Kabushiki Kaisha. Movable tape-guide control system. 4,389,684, Cl. 360-71.000.

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Aihoshi, Hiroaki: *See*—
Takeyama, Hidetoshi; Sakamoto, Siro; Sagawa, Koji; Tanishi, Tokio; Aihoshi, Hiroaki; and Morinoto, Takao, 4,388,757, Cl. 29-882.000.

Air Products and Chemicals, Inc.: *See*—
Dalton, Augustine I., Jr.; Greskovich, Eugene J.; and Skinner, Ronald W., 4,389,390, Cl. 423-584.000.

Aisawa, Shiro: *See*—
Lee, Yuen F.; and Aisawa, Shiro, 4,389,054, Cl. 277-214.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,389,581, Cl. 307-419.000.

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Hiraga, Hirofumi; Yoshimura, Minoru; Ikeda, Shigeho; and Yoshii, Hiroe, 4,389,483, Cl. 435-110.000.

AKG Akustische u. Kino-Ger/ te: *See*—
Gorike, Rudolf, 4,389,542, Cl. 179-1.00R.

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Leunig, Carl V., 4,389,228, Cl. 55-379.000.

Albert, Eugene V., to Q Corporation. Cutter ring and method of making same. 4,388,848, Cl. 83-666.000.

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Schaefer, Horst; and Votteler, Hans, 4,388,961, Cl. 160-332.000.

Alleman, Raymond A.: *See*—
Weber, Donald M.; and Alleman, Raymond A., 4,389,279, Cl. 156-640.000.

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Debell, John H., Jr.; and Allen, David J., 4,388,762, Cl. 33-185.00R.

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Baughman, Ray H.; Patel, Gordhanbhai N.; and Miller, Granville G., 4,389,217, Cl. 436-2.000.
Diamond, Steven E.; Mares, Frank; and Szalkiewicz, Andrew, 4,389,348, Cl. 260-465.50R.
Dickson, James; Okazaki, Kenji; and Sanders, Thomas H., 4,389,258, Cl. 148-3.000.
James, Leonard E.; Crescentini, Lamberto; and Fisher, William B., 4,389,339, Cl. 252-472.000.
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,389,293, Cl. 204-180.00P.
Marshall, Robert M., 4,389,456, Cl. 428-375.000.
Sladek, Norbert J.; Avery, Roger P.; and Bruno, Saverio T., 4,389,625, Cl. 333-260.000.
Stephenson, Robert L., 4,389,059, Cl. 280-808.000.
Tanner, Lee E., 4,389,262, Cl. 148-403.000.

Allied Paper Incorporated: *See*—
Whalen-Shaw, Michael J.; and Thiessen, Robert J., 4,389,476, Cl. 430-64.000.

Allison, William D. Pumping mechanism. 4,388,836, Cl. 74-41.000.

Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., to Arthur D. Little, Inc. Thermal control system. 4,388,964, Cl. 165-32.000.

Alpkvist, Jan A. Combustor for burning a volatile fuel with air. 4,389,185, Cl. 431-164.000.

Altex Scientific, Inc.: *See*—
Magnussen, Haakon T., Jr.; and Ruskewicz, Stephen J., 4,389,163, Cl. 417-2.000.

Althausen, Ferdinand: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferdinand, 4,389,375, Cl. 422-111.000.

American Can Company: *See*—
Maxwell, Dorothy; and Feil, David A., 4,389,503, Cl. 524-38.000.
Schaefer, Suzanne E.; and Knott, Jack E., II, 4,389,450, Cl. 428-212.000.
Van Alsburg, Earl R., 4,389,147, Cl. 413-69.000.

American Cyanamid Company: *See*—
Feit, Yoseph; Kilanowski, David R.; and Olson, Kenneth E., 4,389,386, Cl. 423-365.000.
Murdock, Keith C., 4,389,399, Cl. 424-248.500.
Schenkel, Robert H., 4,389,402, Cl. 424-251.000.

American Hoechst Corporation: *See*—
Westcott, Robert F.; and Delamater, John R., 4,389,179, Cl. 425-302.100.

American Hospital Supply Corporation: *See*—
Schober, Robert C., 4,388,927, Cl. 128-419.0PG.

American Science and Engineering, Inc.: *See*—
Stein, Jay, 4,389,729, Cl. 378-99.000.

American Store Equipment Corporation: *See*—
Logie, Charles F., 4,388,783, Cl. 52-36.000.

Ames, Douglas A. Photovoltaic device for producing electrical and heat energy. 4,389,533, Cl. 136-248.000.

AMP Incorporated: *See*—
Coldren, Daniel R., 4,389,021, Cl. 339-126.00R.

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Anchoring International, Inc.: *See*—
Suttles, Jefferies C., 4,389,034, Cl. 248-49.000.

Anders, Ronald J., to Rockwell International Corporation. Double disc gate vale with replaceable spacer ring. 4,389,037, Cl. 251-327.000.

Anderson Bros. Mfg. Co.: *See*—
Stohlquist, Roger H.; and Strombeck, Leo, 4,388,795, Cl. 53-435.000.

Anderson, Frank H. Rebar tie. 4,388,791, Cl. 52-719.000.

Anderson, Greenwood & Co.: *See*—
Powell, Walter W., 4,388,940, Cl. 137-70.000.

Anderson, Paul A.; Hammer, Jeffrey M.; and MacArthur, J. Ward, to Honeywell Inc. Apparatus for power load-shedding with auxiliary commandable thermostat. 4,389,577, Cl. 307-39.000.

Ando Electric Co., Ltd.: *See*—
Nigorikawa, Atsushi; Yokoyama, Hiroshi; and Fujieda, Takanori, 4,389,723, Cl. 371-27.000.

Anelva Corporation: *See*—
Itoh, Tadatsugu, 4,389,573, Cl. 250-492.200.

Anezaki, Shoji: *See*—
Okamura, Shozo; Nakajima, Hidemasa; Marukawa, Katsuhiyo; Anezaki, Shoji; and Hirata, Takeyuki, 4,389,246, Cl. 75-60.000.

Anstett, Maurice. Protective butchers glove. 4,388,733, Cl. 2-161.00R.

Aoki, Akihiro: *See*—
Shimada, Keizo; Mera, Hiroshi; Nakamura, Tsutomu; and Aoki, Akihiro, 4,389,521, Cl. 528-336.000.

Apfel, Richard, to Cedco, Incorporated. Diesel engine incorporating emulsified fuel supply system. 4,388,893, Cl. 123-25.00J.

Arai, Hajime; and Haga, Shoji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission fluid pressure control device with two stepped line pressures. 4,388,844, Cl. 74-752.00C.

Arai, Hiroshi: *See*—
Torii, Taketsugu; Oota, Hisatoshi; and Arai, Hiroshi, 4,389,639, Cl. 340-539.000.

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Conciauro, Giuseppe; and Arcioni, Paolo, 4,389,594, Cl. 315-39.550.

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Teshima, Toru; Ariga, Kazuo; and Kasahara, Takao, 4,389,095, Cl. 350-334.000.

Arlt, Dieter; Homeyer, Bernhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Pesticidally active novel phosphoric (phosphonic) acid ester amides. 4,389,530, Cl. 556-404.000.

Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, to Electro-Matic Products Co. Apparatus for packaging magnetic articles. 4,388,792, Cl. 53-236.000.

Armstrong World Industries, Inc.: *See*—
De Santis, William D., 4,388,863, Cl. 101-129.000.
Qualls, Ned S., 4,389,699, Cl. 362-217.000.

Arndt, Gerhard: *See*—
Guntermann, Hans; Arndt, Gerhard; and Baum, Gustav, 4,389,015, Cl. 238-150.000.

Arthur D. Little, Inc.: *See*—
Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., 4,388,964, Cl. 165-32.000.

Asahi Glass Company Ltd.: *See*—
Suhara, Manabu; Gunjima, Tomoki; and Miyake, Haruhisa, 4,389,494, Cl. 521-27.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Okajima, Kunihiko; Kamide, Kenji; and Matsui, Toshihiko, 4,389,523, Cl. 536-59.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ohishi, Michiro, 4,389,097, Cl. 350-410.000.
Sugiyama, Takahiro; and Hagiwara, Yukio, 4,389,100, Cl. 350-478.000.

Asahina, Kenichi: *See*—
Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.

Asai, Komei: *See*—
Hori, Yoshikazu; Asai, Komei; and Fukai, Masakazu, 4,389,096, Cl. 350-339.00R.

Asano, Kiyomitsu; Kondo, Toshikatsu; and Sakaida, Atsuo, to Brother Kogyo Kabushiki Kaisha; and Nippon Telecommunication Engineering Company. Print head for a dot matrix printer. 4,389,128, Cl. 400-124.000.

Asao, Yasuzi, to Fuji Photo Film Co., Ltd. Photographic resin coated paper. 4,389,455, Cl. 428-328.000.

ASEA Aktiebolag: *See*—
Larsson, Hans-Gunnar, 4,389,362, Cl. 264-111.000.

Ashland Oil, Inc.: *See*—
Chu, Richard S.; and Mansour, Maher L., 4,389,357, Cl. 264-40.100.

Aspy, Robert M., to Congoleum Corporation. Marking device. 4,388,760, Cl. 33-42.000.

Atkinson, Cyril M.; and Strong, Barry C. Weaving looms having rotary shed forming drums and beat up mechanisms therefor. 4,388,951, Cl. 139-11.000.

Atkinson, Wallace E. Weed and grass puller. 4,389,065, Cl. 294-50.800.

Atlas Copco Aktiebolag: *See*—
Gidlund, Per A. L., 4,388,972, Cl. 173-162.00R.

Atwood, Gilbert R.: *See*—
Sokolik, Joseph E., Jr.; Kosseim, Alexander J. M.; and Atwood, Gilbert R., 4,389,383, Cl. 423-243.000.

Au, Andrew T., to Dow Chemical Company, The. Cyano-(2,4-dichlorophenyl)methyl ethyl ester of carbonic acid useful as a nematocide. 4,389,411, Cl. 424-301.000.

Audemars, Daniel: *See*—
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,389,251, Cl. 75-255.000.

Audichron Company, The: *See*—
Glisson, David; Huber, Gerald; and Biskey, Bruce, 4,389,546, Cl. 179-18.00B.

Aurora Design Associates, Inc.: *See*—
Gardner, James H.; and de Nevers, Noel H., 4,388,813, Cl. 62-457.000.

Ausonia Farmaceutici s.r.l.: *See*—
Di Schiena, Michele; and Orru, Vittoria, 4,389,407, Cl. 424-271.000.

Ausseil, Dominique. Microfilm cassette and the projection apparatus for the viewing of same. 4,389,104, Cl. 353-26.00R.

Autoflug-Stakupress GmbH & Co.: *See*—
Krautz, Kurt; and Ender, Erhard, 4,388,746, Cl. 24-230.00A.

Autoipari Kutato es Fejleszto Vallalat: *See*—
Szarka, Istvan; and Urbantsok, Janos, 4,388,806, Cl. 60-547.100.

Avery, Roger P.: *See*—
Sladek, Norbert J.; Avery, Roger P.; and Bruno, Saverio T., 4,389,625, Cl. 333-260.000.

Avions Marcel Dassault-Breguet Aviation: *See*—
Levy, Fernand J., 4,389,340, Cl. 252-512.000.

Azuchi, Yukihiro, to Murata Manufacturing Co., Ltd. Trimmer capacitor. 4,389,696, Cl. 361-293.000.

B. F. Goodrich Company, The: *See*—
Messerly, James W., 4,389,361, Cl. 264-108.000.

Baba, Tetsuro: *See*—
Sato, Hiroyasu; Sato, Yoshiharu; and Baba, Tetsuro, 4,389,628, Cl. 335-208.000.

Babcock & Wilcox Company, The: *See*—
Thornton, Thomas A.; and Holaday, Veldon D., Jr., 4,389,355, Cl. 264-0.500.

Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, to Robert Bosch GmbH. Electrically controlled valve operating system, particularly for fuel injection. 4,388,908, Cl. 123-500.000.

Bacehowski, David V.; and Brown, Michael J., to Baxter Travenol Laboratories, Inc. Centrifugal processing apparatus and rotatable processing bowl apparatus. 4,389,206, Cl. 494-42.000.

Bacehowski, David V.; and Bucheger, Ronald, to Baxter Travenol Laboratories, Inc. Rotatable bowl assembly for centrifugal processing apparatus having a bonded and prewound umbilical system. 4,389,207, Cl. 494-42.000.

Bader, Christian, to Daimler-Benz Aktiengesellschaft. Electric drive mechanism for vehicles. 4,388,977, Cl. 180-165.000.

Badesha, Santokh S., to Xerox Corporation. Process for preparation of high purity tellurium. 4,389,389, Cl. 423-510.000.

Badzinski, Richard D.; and Nigel, George G., to Shaft Lok Inc. Shaft lock for propellers for sailing boats. 4,389,199, Cl. 440-74.000.

Bairamov, Jury J.: *See*—
Zhorov, Vladimor I.; Kirsh, Jury E.; Shumsky, Viktor I.; Karaputadze, Temuri M.; and Bairamov, Jury J., 4,389,404, Cl. 424-260.000.

Baitis, A. Erich; Woolaver, Dennis A.; and Nigon, Richard T., to United States of America, Navy. Electrical actuator for ship roll stabilization. 4,388,889, Cl. 114-144.00E.

Baker, Alan C.; Boulter, Geoffrey N.; and Wilbert, Daniel H., to Direct Reduction Corporation, The. Interior arrangement for direct reduction rotary kilns and method. 4,389,242, Cl. 75-20.00R.

Baker International Corporation: *See*—
Peterson, Elmer R., 4,388,971, Cl. 166-387.000.

Baker, William L., Jr.: *See*—
Perna, Theodore P.; Raschke, Curt R.; and Baker, William L., Jr., 4,389,658, Cl. 346-140.00R.

Bakke, Even: *See*—
Willett, Howard P.; and Bakke, Even, 4,389,225, Cl. 55-118.000.

Balaban, Alvin R.; Steckler, Steven A.; and Fernsler, Ronald E., to RCA Corporation. Television receiver high voltage protection circuit. 4,389,676, Cl. 358-243.000.

Baldock, K. Paul, to John Fluke Mfg. Co., Inc. Method and apparatus for enhancing the output of an RMS converter. 4,389,708, Cl. 364-573.000.

Baldwin Piano & Organ Company: *See*—
Uetrecht, Dale M., 4,388,850, Cl. 84-1.240.

Baldwin, Roger A.: *See*—
Garwin, Leo; and Baldwin, Roger A., 4,389,302, Cl. 208-86.000.

Ball Corporation: *See*—
Mirra, Michael J.; and Giles, Albert H., 4,389,459, Cl. 428-457.000.

Ballantine, James S. Water-going vessel. 4,389,197, Cl. 440-38.000.

Ballard, Billy G.: *See*—
Godbey, John K.; and Ballard, Billy G., 4,389,164, Cl. 417-36.000.

Ballato, Arthur, to United States of America, Army. Quartz resonator angle correction. 4,389,275, Cl. 156-626.000.

Ban, Mikichi; and Ito, Susumu, to Canon Kabushiki Kaisha. Observing apparatus. 4,389,084, Cl. 350-524.000.

Ban, Vladimir S.: *See*—
Datta, Pabitra; Poliniak, Eugene S.; and Ban, Vladimir S., 4,389,441, Cl. 428-65.000.

Bannikov, Jury G.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.;

Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Bar-on, Ari; and Debesis, John R., to Xerox Corporation. Ink jet droplet generator fabrication method. 4,389,654, Cl. 346-75.000.

Bargon, Joachim; Hiraoka, Hiroyuki; and Welsh, Lawrence W., Jr., to International Business Machines Corporation. Process for forming photoresists with strong resistance to reactive ion etching and high sensitivity to mid- and deep UV-light. 4,389,482, Cl. 430-325.000.

Barkhau, Marvin L.; Perry, Philip D.; and Pimm, Roland F., to Owens-Illinois, Inc. Electric boosting control for a glass forehearth. 4,389,725, Cl. 373-40.000.

Barry, George H.: *See*—
Dahl, Ernest A.; and Barry, George H., 4,389,608, Cl. 320-33.000.

Bartels, Leroy R.; and Milbright, Arnold M., to International Telephone and Telegraph Corporation. Lightweight ladder. 4,388,983, Cl. 182-189.000.

Barton, Roy C. Land-use portable knock-down hunting-blind frame. 4,388,939, Cl. 135-3.00R.

Bartoszek, John T.: *See*—
Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., 4,388,964, Cl. 165-32.000.

BASF Aktiengesellschaft: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,389,216, Cl. 8-639.000.
Hoffmann, Gerhard; and Neumann, Peter, 4,389,475, Cl. 430-58.000.
Horacek, Heinrich; Marx, Matthias; and Hobein, Dietmar, 4,389,454, Cl. 428-318.600.
May, Hans-Joachim; Lenke, Dieter; Gries, Josef; Teschendorf, Hans-Juergen; and Worstmann, Wolfgang, 4,389,403, Cl. 424-258.000.

BASF Wyandotte Corporation: *See*—
Wilson, Joe C.; Eisenstein, Stephen E.; Maxwell, Jerrold F.; and Hirozawa, Stanley T., 4,389,371, Cl. 422-15.000.

Bat, Jury I.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Battelle Development Corporation: *See*—
Dinovo, Salvatore T., 4,389,381, Cl. 423-175.000.

Baues, Peter, to Siemens Aktiengesellschaft. Optical device for non-contact recording and particular facsimile reproduction of images and test. 4,389,655, Cl. 346-107.00R.

Baughman, Ray H.; Patel, Gordhanbhai N.; and Miller, Granville G., to Allied Corporation. Integrated time-temperature or radiation-dosage history recording device. 4,389,217, Cl. 436-2.000.

Baukholt, Heinz: *See*—
Boeke, Burkhard; Kalka, Josef; Smolinski, Manfred; and Baukholt, Heinz, 4,389,522, Cl. 528-503.000.

Baum, Gustav: *See*—
Guntermann, Hans; Arndt, Gerhard; and Baum, Gustav, 4,389,015, Cl. 238-150.000.

Bauman, Ronald M., to United States of America, Navy. Adaptive feed-forward system. 4,389,618, Cl. 330-149.000.

Baumer, Hans, to Licentia Patent-Verwaltungs-GmbH. Circuit arrangement for a combined proximity and impact fuse. 4,388,867, Cl. 102-211.000.

Baxter, Leslie A.; Berkowitz, Paul R.; and Buzzard, Clair A., to Bell Telephone Laboratories, Incorporated. Distributed digital conferencing system. 4,389,720, Cl. 370-62.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bacehowski, David V.; and Brown, Michael J., 4,389,206, Cl. 494-42.000.
Bacehowski, David V.; and Bucheger, Ronald, 4,389,207, Cl. 494-42.000.
Molthop, Susan C., 4,389,363, Cl. 264-135.000.

Bayer AG: *See*—
Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,389,507, Cl. 524-460.000.

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Arlt, Dieter; Homeyer, Bernhard; and Hammann, Ingeborg, 4,389,530, Cl. 556-404.000.
Leusner, Bernhard; Schulz, Hans-Hermann; Voigt, Reiner; and Walkowiak, Michael, 4,389,496, Cl. 523-109.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,389,215, Cl. 8-637.000.
Preiss, Michael; and Schutt, Hermann, 4,389,489, Cl. 435-280.000.
Schaefer, Axel; Motika, Werner; Bender, Wolfgang; Todt, Jorn; and Oels, Udo, 4,389,344, Cl. 260-369.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Fritzenwenger, Josef, 4,388,979, Cl. 180-226.000.

BBC Brown, Boveri & Company Limited: *See*—
Melton, Keith; Mercier, Olivier; and Riegger, Helmut, 4,389,250, Cl. 75-252.000.

Beard, Harold. Variable venturi sewerage aerator. 4,389,312, Cl. 210-198.100.

Beck, Walter: *See*—
Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,388,908, Cl. 123-500.000.

Beckman Instruments, Inc.: *See*—
Sutton, John H.; and Woodruff, Rebecca J., 4,389,374, Cl. 422-104.000.

Becton Dickinson and Company: *See*—
Burns, James A., 4,388,925, Cl. 128-314.000.
Telang, Anil, 4,388,922, Cl. 604-319.000.

Beecham Group Limited: *See*—
Dorgan, Roderick J.; and Webster, Richard A., 4,389,406, Cl. 424-270.000.
O'Hanlon, Peter J.; and Rogers, Norman H., 4,389,410, Cl. 424-283.000.

Beecham Products: *See*—
Green, Donald L., 4,389,448, Cl. 428-195.000.

Beemer, Richard B.: *See*—
Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., 4,388,987, Cl. 192-3.260.

Behr-Thomson Dehnstoffregler GmbH: *See*—
Saur, Roland; and Kurz, Manfred, 4,389,629, Cl. 337-126.000.

Bell, Gordon D.: *See*—
Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,388,743, Cl. 16-116.00A.

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Guzik, Rudolph, 4,389,478, Cl. 430-97.000.

Bell, Melvyn R.; Morrison, John M.; and Stewart, Charles M., to Ferranti plc. Circuit assembly having a component with leads extending therefrom and a connector both supported on a planar substrate. 4,389,697, Cl. 361-380.000.

Bell Telephone Laboratories, Incorporated: *See*—
Baxter, Leslie A.; Berkowitz, Paul R.; and Buzzard, Clair A., 4,389,720, Cl. 370-62.000.
Bowen, Edward G.; and Netravali, Arun N., 4,389,672, Cl. 358-160.000.
Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodink, Catherine, 4,389,291, Cl. 204-129.300.

Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, to Nuodex, Inc. Drier systems for water-borne surface-coating compositions. 4,389,328, Cl. 252-194.000.

Bellinger, James E., to Florida Data Corporation. High speed dot matrix impact printer. 4,389,127, Cl. 400-124.000.

Bendayan, Jacques; and Jocteur, Robert, to Les Cables de Lyon S.A. Mechanical protection and reinforcement for optical fibers. 4,389,087, Cl. 350-96.230.

Bender, Emil A. Positive engagement fail safe mechanism and lift belt construction for long stroke, well pumping unit. 4,388,837, Cl. 74-89.200.

Bender, Wolfgang: *See*—
Schaefer, Axel; Motika, Werner; Bender, Wolfgang; Todt, Jorn; and Oels, Udo, 4,389,344, Cl. 260-369.000.

Bendix Corporation, The: *See*—
deValpillieres, Didier J., 4,388,825, Cl. 73-115.000.
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,389,081, Cl. 339-89.00M.
Normann, Richard W.; and Niles, Paul D., 4,389,083, Cl. 339-105.000.

Bendyshe Walton, Andre P. J.; Townsend, Francis H.; and Ribet, John N., to C. Tape Developments Limited. Flexible tape electroacoustic transducer using an electret. 4,389,580, Cl. 307-400.000.

Benisti, Julien. Device for the elaboration, the composition, the mixing and the use of liquids, products or ingredients. 4,388,839, Cl. 73-428.000.

Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., to Intermedics Cardiassist Corporation. Rapid stabilization of external cardiac pulsation. 4,388,919, Cl. 128-64.000.

Bennol Corporation: *See*—
Molayem, Benjamin; and Garrett, David, 4,388,877, Cl. 110-342.000.

Benton, Kenneth C.: *See*—
Weinert, Raymond J., Jr.; and Benton, Kenneth C., 4,389,334, Cl. 252-429.00B.

Beretta, Pier C., to Fabrica D'Armi Pietro Beretta S.p.A. Lever-type closing device for blocking and unblocking the barrel of automatic, portable firearms. 4,388,773, Cl. 42-75.00B.

Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, to BASF Aktiengesellschaft. Navy dye mixtures. 4,389,216, Cl. 8-639.000.

Berkowitz, Paul R.: *See*—
Baxter, Leslie A.; Berkowitz, Paul R.; and Buzzard, Clair A., 4,389,720, Cl. 370-62.000.

Bernard, Clay, II; Matheny, William F., III; Faith, Charles M.; Goswick, Richard L.; and Hauth, Jerry L., to SPS Technologies, Inc. Retrieval and storage mechanism for use with an automated rotating storage unit. 4,389,157, Cl. 414-787.000.

Berry, Chapman; and Hackenberg, Robert A., to Robertson Paper Box Co., Inc. Double-walled carton and blank for forming same. 4,388,999, Cl. 220-416.000.

Berthiaume, Richard P.: *See*—
Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., 4,388,964, Cl. 165-32.000.

Best Lock Corporation: *See*—
Foshee, William R., 4,389,061, Cl. 292-169.140.

Beyer, Herbert: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wieklinski, Bernhard; Maimusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.

Bhatia, Harsaran S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Lechaton, John S.; and Walsh, James L., 4,389,281, Cl. 156-646.000.
Anantha, Narasipur G.; Bhatia, Harsaran S.; Mauer, John L., IV; and Sarkary, Homi G., 4,389,294, Cl. 204-192.00E.

Bickel, Hans: *See*—
Scartazzini, Riccardo; and Bickel, Hans, 4,389,524, Cl. 544-016.000.

Bio-Rad Laboratories, Inc.: *See*—
Hanamoto, Mark S.; and Tanaka, Steve K., 4,389,491, Cl. 436-67.000.

Birdwell, Glenn E. Intake expansion chamber apparatus for internal combustion engines. 4,388,910, Cl. 123-547.000.

Bishop, John F.; and Bowman, Wayne A., to Eastman Kodak Company. Neutralizing layer for color transfer assemblages. 4,389,479, Cl. 430-216.000.

Biskey, Bruce: *See*—
Glisson, David; Huber, Gerald; and Biskey, Bruce, 4,389,546, Cl. 179-18.00B.

Bjorkman, Harry K., Jr., to Energy Development Associates, Inc. Metal halogen battery system with multiple outlet nozzle for hydrate. 4,389,468, Cl. 429-70.000.

Blackfire Coal Products: *See*—
Pike, John C., 4,389,218, Cl. 44-6.000.

Blair, Matthew J.; Wiktorowski, Thomas A.; and Wogan, W. Dale, to Republic Steel Corporation. Lance ladling. 4,389,245, Cl. 75-58.000.

Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Projection unit with separable lamp capsule and slidable means for ejecting same. 4,389,700, Cl. 362-306.000.

Blasco, Eduardo G., to Industrias Y Confecciones, S.A. (INDUYCO). Sewing machine incorporating a programmable control and a low-inertia motor. 4,389,604, Cl. 318-568.000.

Bleidt, Rolf: *See*—
Konig, Werner; Wagenbach, Wolfgang; May, Hans; and Bleidt, Rolf, 4,389,553, Cl. 200-148.00H.

Block, Jacob; and Green, Peter C., to W. R. Grace & Co. High temperature stable viscosifier and fluid loss control system. 4,389,319, Cl. 252-8.50A.

Bloem, Jan; and van den Brekel, Cornelis H. J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,389,273, Cl. 156-605.000.

Blom, Cornelis W.; and van Keulen, Jacobus M., to Woodcap, B.V. Liquid absorbing fibrous material treated with a wood preservative agent. 4,389,446, Cl. 428-166.000.

Boadway, John D., to Queen's University at Kingston. Arrangement of multiple fluid cyclones. 4,389,307, Cl. 209-211.000.

Boeing Company, The: *See*—
Glasenapp, Rudi K. H.; and McCulloch, Andrew J., 4,389,029, Cl. 244-103.00R.

Boeke, Burkhard; Kalka, Josef; Smolinski, Manfred; and Baukholt, Heinz, to Chemische Werke Huls, A.G. Process for the thermal after-treatment of paste-forming polymers of vinyl chloride. 4,389,522, Cl. 528-503.000.

Boghosian, Harry: *See*—
Innis, Charles L., Jr.; Salter, Lowell S., Jr.; Boghosian, Harry; and Wilkinson, Donald H., 4,389,053, Cl. 277-95.000.

Bohanon, Hoy R., Sr., to Acme Engineering & Manufacturing Corporation. Cooling pad support assembly. 4,389,352, Cl. 261-106.000.

Bohg, Armin; and Hartmann, Kurt, to International Business Machines Corporation. Bank for accommodating several print hammer units. 4,388,861, Cl. 101-93.020.

Bohman, Carl E.: *See*—
Minor, Ray C.; Treichler, James W.; and Bohman, Carl E., 4,389,154, Cl. 414-699.000.

Boller, Arthur; Schadt, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Meterocyclic compounds. 4,389,329, Cl. 252-299.100.

Bon, Luigi D. Self-closing tilting valve. 4,389,004, Cl. 222-402.220.

Bonagura, Ronald L.: *See*—
Floyd, Thomas D.; Nelson, Roland D.; and Bonagura, Ronald L., 4,389,117, Cl. 355-87.000.

Bonfiglioli, Giampaolo: *See*—
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,388,752, Cl. 29-421.00R.

Bonney, Roland W. Multiple four-way control valve. 4,388,949, Cl. 137-625.170.

Bordes, Cornelis, to Marine Structure Consultants (MSC) BV. Locking device for a pile-shaped element. 4,389,140, Cl. 405-195.000.

Bordet, Rene: *See*—
Queffelec, Corentin; Bordet, Rene; and Malinowsky, Marc, 4,388,785, Cl. 52-222.000.

Bornstein, Norman S.: *See*—
Smeggil, John G.; and Bornstein, Norman S., 4,389,463, Cl. 428-659.000.

Bosco, Lewis R., to Penn Wood Products Co. Wood floor panel. 4,388,788, Cl. 52-390.000.

Bouhier, Roger: *See*—
Garnaud, Guy; and Bouhier, Roger, 4,388,823, Cl. 73-57.000.

Boulter, Geoffrey N.: *See*—
Baker, Alan C.; Boulter, Geoffrey N.; and Wilbert, Daniel H., 4,389,242, Cl. 75-20.00R.

Bourke, Robert S.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Treatment of gray matter edema. 4,389,417, Cl. 424-317.000.

Bowden, Wade R., Jr.: *See*—
Slater, Thomas S.; and Bowden, Wade R., Jr., 4,389,535, Cl. 174-65.00R.

Bowen, Edward G.; and Netravali, Arun N., to Bell Telephone Laboratories, Incorporated. Display of pseudo-gray scale picture signals on multilevel displays. 4,389,672, Cl. 358-160.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D.; and Morris, Joseph W., 4,388,950, Cl. 137-829.000.

Bowman, Wayne A.: *See*—
Bishop, John F.; and Bowman, Wayne A., 4,389,479, Cl. 430-216.000.

Boyanowski, Robert E.; Gregory, Floyd A.; and Nemier, Stanley E., to International Business Machines Corporation. Web supply roll jogger. 4,389,008, Cl. 226-123.000.

Boyesen, Eyvind, to Performance Industries, Inc. Fuel porting for two cycle internal combustion engine. 4,388,895, Cl. 123-73.0PP.

Braithwaite, John C.; and Smith, Ian, to British Gas Corporation. Speed control system for a pipeline inspection vehicle. 4,388,871, Cl. 104-138.00G.

Brandell, John T., to Halliburton Company. Downhole tool suction screen assembly. 4,388,968, Cl. 166-236.000.

Brandman, Haroid A.: *See*—
Valentine, Roy H.; and Brandman, Harold A., 4,389,527, Cl. 549-438.000.

Branson Ultrasonics Corporation: *See*—
Denslow, Clark A., 4,389,267, Cl. 156-73.200.

Breese, Leonard S., to Thermalloy Incorporated. Solderable mounting stakes for heat sinks. 4,388,967, Cl. 165-80.00B.

Breon, Everett C., to Haghighi, Kamal Banani. Automatic sewer cleaning system. 4,388,741, Cl. 15-104.3SN.

British-American Tobacco Company Limited: *See*—
Luke, John A., 4,388,934, Cl. 131-339.000.

British Gas Corporation: *See*—
Braithwaite, John C.; and Smith, Ian, 4,388,871, Cl. 104-138.00G.

Brockway Glass Co., Inc.: *See*—
Dembicki, Michael T.; and Poad, William J., 4,389,266, Cl. 156-69.000.

Brooke, Michael E., to United States Gypsum Company. Enclosure for bathtub or shower having sliding doors. 4,388,778, Cl. 49-125.000.

Brookes, David J., to USM Corporation. Method of loading rivets. 4,388,753, Cl. 29-433.000.

Brookes, John R.: *See*—
Chahroudi, Day; and Brookes, John R., 4,389,452, Cl. 428-215.000.

Brooks, Seville R.: *See*—
Luscombe, Anthony P.; and Brooks, Seville R., 4,389,648, Cl. 343-8.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Sakaida, Atsuo, 4,389,128, Cl. 400-124.000.
Hirota, Kunio; and Shimomura, Masao, 4,388,883, Cl. 112-121.120.
Hirota, Kunio; and Shimomura, Masao, 4,388,884, Cl. 112-121.120.
Sugiura, Toshiaki, 4,389,129, Cl. 400-144.200.
Yamamoto, Yoshikazu; and Yanagi, Toshiaki, 4,388,882, Cl. 112-121.120.

Brown, Boveri & Cie AG: *See*—
Konig, Werner; Wagenbach, Wolfgang; May, Hans; and Bleidt, Rolf, 4,389,553, Cl. 200-148.00H.

Brown, David J., to Massey-Ferguson Services N.V. Control lever arrangement. 4,389,151, Cl. 414-685.000.

Brown, Gregory N.: *See*—
Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,388,743, Cl. 16-116.00A.

Brown, Michael A.: *See*—
Kalivretenos, Chris A.; and Brown, Michael A., 4,389,028, Cl. 244-3.210.

Brown, Michael J.: *See*—
Bacehowski, David V.; and Brown, Michael J., 4,389,206, Cl. 494-42.000.

Brown, Richard P., to CTS Corporation. Side actuated miniature dip switch. 4,389,549, Cl. 200-5.00R.

Brown, Robert J. S., to Chevron Research Company. Computer-controlled, portable pulsed NMR instrument and method of use. 4,389,613, Cl. 324-303.000.

Brownscombe, Thomas F.: *See*—
De La Mare, Harold E.; and Brownscombe, Thomas F., 4,389,515, Cl. 525-420.500.

Brumen, Claudio, to United Technologies Corporation. Locking of rotor blades on a rotor disk. 4,389,161, Cl. 416-220.00R.

Bruno, Saverio T.: *See*—
Sladek, Norbert J.; Avery, Roger P.; and Bruno, Saverio T., 4,389,625, Cl. 333-260.000.

Brunswick Corporation: *See*—
Sheridan, Stephen E.; and Hundertmark, James M., 4,388,896, Cl. 123-73.0AD.

Brunt, William H.; and Thatcher, Kenneth C., to Tegral Technology Limited. Methods of making asbestos-free, glass fibre reinforced, cement composite products and the products of such methods. 4,389,359, Cl. 264-69.000.

Bryan, Thomas J.: *See*—
Rodgers, David T.; Tursi, Thomas P.; and Bryan, Thomas J., 4,388,782, Cl. 51-241.00A.

Bryan, William J., to Westinghouse Electric Corp. Bi-metallic grid for a nuclear reactor fuel assembly. 4,389,369, Cl. 376-442.000.

Bucheger, Ronald: *See*—
Bacehowski, David V.; and Bucheger, Ronald, 4,389,207, Cl. 494-42.000.

Buckbee-Mears Company: *See*—
Thoms, Roland, 4,389,592, Cl. 313-403.000.

Budde, John S.: *See*—
Underwood, J. Larry; Thompson, Stephen M.; and Budde, John S., 4,388,998, Cl. 220-307.000.

Buky, Gabriel R.: *See*—
Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,388,792, Cl. 53-236.000.

Bureau de Recherches Geologique et Minieres: *See*—
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,389,020, Cl. 241-24.000.

Bures, Horst-Dieter: *See*—
Moller, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, 4,389,226, Cl. 55-208.000.

Burgess, Donald M. Apparatus for playing a spectator-controlled game. 4,389,048, Cl. 273-121.00A.

Burk, John H. Rock crusher breaker blocks and adjustment apparatus. 4,389,022, Cl. 241-275.000.

Burkart, Jeffrey A.: *See*—
Walsh, Paul J.; and Burkart, Jeffrey A., 4,389,462, Cl. 428-564.000.

Burns, James A., to Becton Dickinson and Company. Automatic retractable lancet assembly. 4,388,925, Cl. 128-314.000.

Burns, Richard D., to General Electric Company. Methods of making improved rotor assembly. 4,388,756, Cl. 29-598.000.

Burns, Richard D., to General Electric Company. Dynamoelectric machine phase insulators and apparatus for making the same. 4,389,584, Cl. 310-43.000.

Burr, Charles R., Jr.: *See*—
Posner, Ronald S.; Burr, Charles R., Jr.; and Campbell, David K., 4,389,671, Cl. 358-124.000.

Burr, Jack, II. Method of making soy milk containing stabilized protein. 4,389,425, Cl. 426-598.000.

Burris, Michael V. Sulfur modified epoxy resin sealing composition. 4,389,501, Cl. 523-400.000.

Burroughs Corporation: *See*—
Chen, Chau-Shiong; and Dixit, Anant O., 4,389,255, Cl. 148-1.500.

Burton, Colin K., to S. C. Johnson & Son, Inc. Skin care composition. 4,389,418, Cl. 424-365.000.

Burton, John A., to Enterprises International, Inc. Ash removal system. 4,388,876, Cl. 110-275.000.

Busch Industrial Products Corporation: *See*—
Palamand, S. R., 4,389,421, Cl. 426-330.400.

Bushmeyer, Richard W., to J. I. Case Company. Exhaust assembly for tractors. 4,388,804, Cl. 60-319.000.

Buzzard, Clair A.: *See*—
Baxter, Leslie A.; Berkowitz, Paul R.; and Buzzard, Clair A., 4,389,720, Cl. 370-62.000.

C. Tape Developments Limited: *See*—
Bendyshe Walton, Andre P. J.; Townsend, Francis H.; and Ribet, John N., 4,389,580, Cl. 307-400.000.

Cable, Richard B.; and Cable, Willie D. Infant carrier. 4,389,005, Cl. 224-159.000.

Cable, Willie D.: *See*—
Cable, Richard B.; and Cable, Willie D., 4,389,005, Cl. 224-159.000.

Cabot Corporation: *See*—
Walsh, Paul J.; and Burkart, Jeffrey A., 4,389,462, Cl. 428-564.000.

Cadwell, Vyrl E. Hitch assembly. 4,389,058, Cl. 280-415.00A.

Caimi, Giovanni: *See*—
Ferri, Beniamino; and Caimi, Giovanni, 4,389,272, Cl. 156-297.000.

Cain, George R., to Koppers Company, Inc. Charging hole cover seal. 4,389,284, Cl. 202-247.000.

Calderon, Albert. Method for making coke via induction heating. 4,389,283, Cl. 201-19.000.

Caldwell, John T.: *See*—
Dowdy, Edward J.; Nicholson, Nicholas; and Caldwell, John T., 4,389,568, Cl. 250-362.000.

Camerik, Eduard, to U.S. Philips Corporation. Apparatus for writing and/or reading information on a rotary information disc with the aid of a radiation beam. 4,389,717, Cl. 369-75.000.

Campbell, David K.: *See*—
Posner, Ronald S.; Burr, Charles R., Jr.; and Campbell, David K., 4,389,671, Cl. 358-124.000.

Campbell, Steve, to PSI Energy Systems, Inc. Thermal energy storage device and method for making the same. 4,388,963, Cl. 165-10.000.

Canada, Atomic Energy of, Limited: *See*—
Hutcheon, Ronald M., 4,389,572, Cl. 250-396.00R.

Canadian Fram Limited: *See*—
Cook, John E., 4,388,856, Cl. 91-49.000.

Canadian Patents & Development Limited: *See*—
Dauphinee, Thomas M., 4,388,829, Cl. 73-384.000.

Canon Kabushiki Kaisha: *See*—
Ban, Mikichi; and Ito, Susumu, 4,389,084, Cl. 350-524.000.
Kasamura, Toshirou, 4,389,046, Cl. 271-227.000.
Kawamura, Masaharu, 4,389,609, Cl. 320-48.000.
Kondo, Hiroatsu; Ozawa, Toshiaki; and Miyakawa, Hideaki, 4,389,131, Cl. 400-157.200.
Noda, Atsushi, 4,389,605, Cl. 318-696.000.
Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; Tosaka, Yoichi; and Haraguchi, Shosuke, 4,389,111, Cl. 354-173.000.

Capuano, Terry D., to Russell, Burdsall & Ward Corporation. Method of tapping dual thread fasteners. 4,389,145, Cl. 408-1.00R.

Carleton, John V.; and Nenadic, Nick, to Union Tank Car. Railroad vehicle. 4,388,873, Cl. 105-377.000.

Carley, Joseph C.: *See*—
Hoskinson, William R.; Carley, Joseph C.; and Ippolito, Anthony C., 4,388,851, Cl. 84-1.240.

Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,389,552, Cl. 200-68.000.

Carminati, Jean; Ehret, Thomas; Ovieve, Gerard; and Thoor, Henry-Albert, to FMC Corporation. Articulated loading arm for the transfer of fluids. 4,388,948, Cl. 137-615.000.

Carpenter, Roy B., Jr. Equipment for protecting electronic equipment and personnel against inadvertent occurrence of extended or transient high voltages and method. 4,389,695, Cl. 361-55.000.

Carrier Corporation: *See*—
Yannascoli, Donald; and Fraser, Bruce A., 4,389,168, Cl. 417-298.000.

Carter, James H., II: *See*—
Crews, Harold R.; Carter, James H., II; and Sena, Ted, 4,389,490, Cl. 436-17.000.

Carter, Russell P., Jr., to Mobay Chemical Corporation. Polycarbonate-silicate compositions. 4,389,500, Cl. 523-216.000.

Case, Arthur L.: *See*—
Davidson, Jackson B.; and Case, Arthur L., 4,389,670, Cl. 358-111.000.

Casio Computer Co., Ltd.: *See*—
Sasaki, Ken, 4,389,704, Cl. 363-62.000.
Tsuzuki, Hanzo, 4,389,707, Cl. 364-405.000.

Castolin S.A.: *See*—
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,389,251, Cl. 75-255.000.

Caterpillar Tractor Co.: *See*—
Williams, Hugh K.; and Thies, Jerome A., 4,388,976, Cl. 180-69.00R.

Cedco, Incorporated: *See*—
Apfel, Richard, 4,388,893, Cl. 123-25.00J.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Colas, Francois, 4,389,134, Cl. 403-263.000.

Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See*—
Tusset, Vittorino; Hancart, Jules; and Paulus, Philippe, 4,389,254, Cl. 134-3.000.

Centro Automazioni Moderne S.p.A.: *See*—
Righi, Bruno, 4,389,205, Cl. 493-315.000.

Cesin, Louie P. Crossbow with coil spring force developing means for projecting an article. 4,388,914, Cl. 124-27.000.

Chahroudi, Day; and Brookes, John R., to Southwall Corporation, The. Transparent infrared radiation absorption system. 4,389,452, Cl. 428-215.000.

Champion International Corporation: *See*—
Lavery, John J., 4,388,993, Cl. 206-611.000.

Champion Spark Plug Company: *See*—
Grime, Thomas E., 4,388,997, Cl. 220-209.000.

Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., to Scientific Systems, Inc. Chromatographic column with improved seals. 4,389,313, Cl. 210-198.200.

Chase, David O.: *See*—
Handy, Binns; and Chase, David O., 4,388,959, Cl. 150-52.00R.

Chaudoir, Roderick J., to Hatco Corporation. Conveyor oven. 4,389,562, Cl. 219-388.000.

Chemische Werke Huls, A.G.: *See*—
Boeke, Burkhard; Kalka, Josef; Smolinski, Manfred; and Baukholt, Heinz, 4,389,522, Cl. 528-503.000.
Moller, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, 4,389,226, Cl. 55-208.000.

Chen, Chau-Shiong; and Dixit, Anant O., to Burroughs Corporation. Method of forming buried collector for bipolar transistor in a semiconductor by selective implantation of poly-si followed by oxidation and etch-off. 4,389,255, Cl. 148-1.500.

Chen, Min F.: *See*—
Cho, Hung H.; and Chen, Min F., 4,389,349, Cl. 260-502.50F.

Chevron Research Company: *See*—
Brown, Robert J. S., 4,389,613, Cl. 324-303.000.
Dahlberg, Arthur J.; Shinn, John H.; Rosenthal, Joel W.; and Chu, Tim T., 4,389,301, Cl. 208-59.000.
Ho, Andrew W., 4,389,400, Cl. 424-248.520.
Mitchell, David S., 4,389,300, Cl. 208-11.0LE.
Polman, Herman A., 4,389,434, Cl. 428-17.000.
Vaughan, Ronald J., 4,389,288, Cl. 204-101.000.

Chien, Wu-Shinn. Reclining chair with supplemental telescoping frame. 4,389,070, Cl. 297-365.000.

Chino Works, Ltd.: *See*—
Uesugi, Toshiaki; and Inden, Toshikazu, 4,389,627, Cl. 335-206.000.

Chinon Kabushiki Kaisha: *See*—
Maruyama, Takashi, 4,389,106, Cl. 354-25.000.

Chisso Corporation: *See*—
Harada, Masato; Suzuki, Atsushi; Yamada, Sadahiko; and Masuda, Jun, 4,389,518, Cl. 526-97.000.

Chlanda, Frederick P.: *See*—
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,389,293, Cl. 204-180.00P.

Cho, Hung H.; and Chen, Min F. Process for preparing of N-phosphenomethyl glycine. 4,389,349, Cl. 260-502.50F.

Chow, Ho, to Melnor Industries, Inc. Vent damper with emergency manual override. 4,389,014, Cl. 236-1.00G.

Chu, Richard S.; and Mansour, Maher L., to Ashland Oil, Inc. Method for preparing thermosetting resins. 4,389,357, Cl. 264-40.100.

Chu, Tim T.: *See*—
Dahlberg, Arthur J.; Shinn, John H.; Rosenthal, Joel W.; and Chu, Tim T., 4,389,301, Cl. 208-59.000.

Ciba-Geigy Corporation: *See*—
Durr, Dieter, 4,389,236, Cl. 71-88.000.
Gannon, John A., 4,389,520, Cl. 528-89.000.
Malherbe, Roger F., 4,389,321, Cl. 252-47.000.
Scartazzini, Riccardo; and Bickel, Hans, 4,389,524, Cl. 544-016.000.
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,389,214, Cl. 8-527.000.

Cibie, Pierre, to Cibie Projecteurs. Headlamp inter alia for motor vehicles. 4,389,698, Cl. 362-32.000.

Cibie Projecteurs: *See*—
Cibie, Pierre, 4,389,698, Cl. 362-32.000.

Cimperman, Frederick J.: *See*—
Margaroli, John L.; and Cimperman, Frederick J., 4,388,858, Cl. 99-494.000.

Cities Service Company: *See*—
Goforth, Charles P.; and Hamshar, John A., III, 4,389,388, Cl. 423-461.000.

Citizen Watch Co., Ltd.: *See*—
Nagata, Hiromichi, 4,389,006, Cl. 224-164.000.
Tsuzuki, Akira, 4,389,728, Cl. 377-114.000.

Ciucani, Mario. Machine for stitching the upper border of shoes commonly called moccasins. 4,388,880, Cl. 112-49.000.

Ciuffolotti, Pierluigi: *See*—
Olivieri, Roberto; Fascetti, Eugenio; Ciuffolotti, Pierluigi; and Degen, Ludwig, 4,389,485, Cl. 435-191.000.

Clampitt, Richard L., to Phillips Petroleum Company. Foamable compositions and formations treatment. 4,389,320, Cl. 252-8.55R.

Clark Equipment Company: *See*—
Vig, Michael A.; and Schmidt, Donald K., 4,388,980, Cl. 180-271.000.

Clark, Eugene V.; and Sievers, George K., to Turbine Metal Technology, Inc. Erosion resistant tubular apparatus for handling slurries. 4,389,439, Cl. 428-36.000.

Clark, Gary T., to Eastman Kodak Company. Preparation of N-substituted anilines. 4,389,531, Cl. 560-43.000.

Clark, Roland E.; DiBartolo, Salvatore J.; and Johansen, Tonny L., to General Electric. Plug-in ceramic hybrid module. 4,389,080, Cl. 339-14.00R.

Clark, Silas W. Variable valve for refrigeration system. 4,388,812, Cl. 62-141.000.

Cleland, Keith B. Apparatus for separating ores. 4,389,308, Cl. 209-444.000.

Clemente, Stefano; Pelly, Brian R.; and Ruttonsha, Rutton, to International Rectifier Corporation. Switching power supply circuit having constant output for a wide range of input voltage. 4,389,702, Cl. 363-21.000.

Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., to Bureau de Recherches Geologique et Minieres. Rotary screens. 4,389,020, Cl. 241-24.000.

Cline, Robert C. Tabbed pocket for use in ring binder and wire bound books. 4,389,060, Cl. 281-38.000.

Clonce, Ambrose J., Jr.: *See*—
Douglas, Ted L.; Clonce, Ambrose J., Jr.; and Jones, Glenn C., 4,389,285, Cl. 203-9.000.

Cockburn, Paul A. Velocipede. 4,389,055, Cl. 280-274.000.

Coder, James D. Automatically-driven chuck accessory for hand drill. 4,389,146, Cl. 408-240.000.

Colas, Francois, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Coupling of a tube to a ring member. 4,389,134, Cl. 403-263.000.

Colby, Daniel E., to McCord Corporation. Modular slush molding machine. 4,389,177, Cl. 425-144.000.

Coldren, Daniel R., to AMP Incorporated. Panel mounted connector for use in confined areas. 4,389,021, Cl. 339-126.00R.

Cole, Frederick A., to Sparton Corporation. Fabric inspection system. 4,389,575, Cl. 250-563.000.

Combustion Engineering, Inc.: *See*—
Yonushonis, Celeste; and Walters, Thomas E., 4,389,282, Cl. 162-145.000.

Cominco Ltd.: *See*—
Higgins, John T., 4,389,356, Cl. 264-9.000.

Commissariate a l'Energie Atomique: *See*—
Pigeon, Michel; Vienot, Claude; and Saglio, Robert, 4,389,611, Cl. 324-220.000.

Conciauro, Giuseppe; and Arcioni, Paolo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Device for electronically tuning a power magnetron. 4,389,594, Cl. 315-39.550.

Congoleum Corporation: *See*—
Aspy, Robert M., 4,388,760, Cl. 33-42.000.
Schmidle, Claude J.; and Varadhachary, Seevaram N., 4,389,514, Cl. 525-364.000.

Conoco Inc.: *See*—
Fair, Delbert W., 4,388,981, Cl. 181-119.000.
Jones, Emrys H., Jr.; and Thakur, Pramod C., 4,388,974, Cl. 175-325.000.

Consolidated Micrographics, Inc.: *See*—
Floyd, Thomas D.; Nelson, Roland D.; and Bonagura, Ronald L., 4,389,117, Cl. 355-87.000.

Cook, John E., to Canadian Fram Limited. Idle speed control actuator. 4,388,856, Cl. 91-49.000.

Cooper, Adrianus A. G.; and Leopold, Phillip M., to Pepsico, Inc. Sports racket. 4,389,269, Cl. 156-172.000.

Cooper, David J.; Waitz, Jay A.; Counelis, Mae; and Weinstein, Jay, to Schering Corporation. Amino glycoside antibiotics having antiprotozoal and anthelmintic activity. 4,389,398, Cl. 424-181.000.

Cooper, Glenn D.; and Katchman, Arthur, to General Electric Company. Blends of polyphenylene ether resins and styrene-tert-butylstyrene copolymers. 4,389,511, Cl. 525-68.000.

Cornwell, Robert, Jr., to PEMCO Corporation. Cable continuity monitoring system. 4,389,694, Cl. 361-48.000.

Corrigan, Francis R., to General Electric Company. Surface characteristics of boron rich cubic boron nitride. 4,389,223, Cl. 51-307.000.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,389,495, Cl. 521-56.000.

Cosme, Peter A. Drawer slide assembly. 4,389,079, Cl. 312-330.00R.

Cote, Gerard: *See*—
Rouillard epouse Bauer, Denise; Cote, Gerard; Fossi, Paolo; and Marchon, Bruno, 4,389,379, Cl. 423-89.000.

Coulter Electronics, Inc.: *See*—
Crews, Harold R.; Carter, James H., II; and Sena, Ted, 4,389,490, Cl. 436-17.000.

Counelis, Mae: *See*—
Cooper, David J.; Waitz, Jay A.; Counelis, Mae; and Weinstein, Jay, 4,389,398, Cl. 424-181.000.

Couture, Paul A.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,388,784, Cl. 52-200.000.

Cowden, Reuel W. Personal property security system. 4,388,734, Cl. 2-250.000.

Cragoe, Edward J., Jr.: *See*—
Bourke, Robert S.; and Cragoe, Edward J., Jr., 4,389,417, Cl. 424-317.000.

Cramer, Roderick L. Dulcimer construction. 4,388,852, Cl. 84-284.000.

Creative Controls, Inc.: *See*—
Tenniswood, David M., 4,389,056, Cl. 280-289.0WC.

Crescentini, Lamberto: *See*—
James, Leonard E.; Crescentini, Lamberto; and Fisher, William B., 4,389,339, Cl. 252-472.000.

Crevling, Robert L.: *See*—
Hajost, Mark J.; Crevling, Robert L.; and Powell, Fred B., 4,388,920, Cl. 128-80.00C.

Crewe, Albert V., to United States of America, Energy. Multiple sextupole system for the correction of third and higher order aberration. 4,389,571, Cl. 250-396.00R.

Crews, Harold R.; Carter, James H., II; and Sena, Ted, to Coulter Electronics, Inc. Method of stabilizing platelets for determining multiple platelet parameters in reference control and calibrator compositions; and diluents thereof. 4,389,490, Cl. 436-17.000.

Crocket, Frank. Filter device with permeable corrugated grid panel. 4,389,315, Cl. 210-357.000.

Crosfield Electronics Limited: *See*—
Kellner, Phillip R., 4,388,865, Cl. 101-401.100.

Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A.: *See*—
Modone, Eros; and Roba, Giacomo, 4,389,230, Cl. 65-3.120.

CTS Corporation: *See*—
Brown, Richard P., 4,389,549, Cl. 200-5.00R.

Cullen, Terry B.: *See*—
Gomola, John W.; Giras, Theodore C.; Wood, William G.; Putman, Richard E.; Gilbreath, Rodney E.; Deliyannides, John S.; Cullen, Terry B.; and Jones, F. David, 4,389,706, Cl. 364-130.000.

Cumings, Norman E., to Mobil Oil Corporation. Marine structure having a deck or work platform supported by absorbing mechanisms. 4,389,141, Cl. 405-211.000.

Cunningham, Joseph W.; and Wing, Lawrence D., to United States of America, National Aeronautics and Space Administration. Automatic thermal switch. 4,388,965, Cl. 165-32.000.

Curtiss-Wright Corporation: *See*—
Griffith, Michael J., 4,389,172, Cl. 418-61.00A.

Cutter, James, to Litton Industrial Products, Inc. Compact collimator. 4,389,730, Cl. 378-153.000.

CVI Incorporated: *See*—
Sarcia, Domenico S., 4,388,809, Cl. 62-6.000.

Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., to United States of America, Army. Ammunition storage and transfer mechanism. 4,388,854, Cl. 89-46.000.

Dahl, Ernest A.; and Barry, George H. Transformerless battery controlled battery charger. 4,389,608, Cl. 320-33.000.

Dahlberg, Arthur J.; Shinn, John H.; Rosenthal, Joel W.; and Chu, Tim T., to Chevron Research Company. Two-step hydroprocessing of heavy hydrocarbonaceous oils. 4,389,301, Cl. 208-59.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Naka, Akihiro; and Honjo, Shuichi, 4,389,219, Cl. 44-51.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Hasegawa, Hiroshi, 4,389,424, Cl. 426-546.000.

Dai Nippon Printing Co. Ltd.: *See*—
Horiguchi, Satoru; and Sasaoka, Takeshi, 4,389,667, Cl. 358-75.000.

Daimer, Wolfgang: *See*—
Pampouchidis, Georgios; Daimer, Wolfgang; and Verdino, Heiner, 4,389,509, Cl. 524-591.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bader, Christian, 4,388,977, Cl. 180-165.000.
Lindenmaier, Klaus, 4,388,911, Cl. 123-557.000.
Thoma, Frank; Hoffmann, Karlheinz; and Seiler, Gunter, 4,389,018, Cl. 239-533.300.

Daiwa Can Company, Limited: *See*—
Nozawa, Tetuo; Nagata, Jun; and Kakimoto, Michiyuki, 4,389,556, Cl. 219-64.000.

d'Alquen, Gunter, to Krall & Roth, Weberei GmbH & Co., K.G. Process and apparatus for producing a twisted elastic thread. 4,388,801, Cl. 57-12.000.

Dalton, Augustine I., Jr.; Greskovich, Eugene J.; and Skinner, Ronald W., to Air Products and Chemicals, Inc. Process for producing hydrogen peroxide. 4,389,390, Cl. 423-584.000.

Damca Corporation: *See*—
Lim, Franklin; and Moss, Richard D., 4,389,419, Cl. 426-72.000.

Dancs, Tibor, to Gulf Oil Corporation. Apparatus for dumping a top-dumping mine car. 4,389,149, Cl. 414-382.000.

Danfoss A/S: *See*—
Riedhammer, Josef, 4,388,941, Cl. 137-82.000.
Schmidt, Jorn M., 4,389,558, Cl. 219-119.000.

Danilin, Evgeny A.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Danner, Bernard; Mau, Hartmut; and Stettler, Hans, to Sandoz Ltd. Asymmetrical diesters of orthophosphoric acid useful as corrosion inhibitors. 4,389,259, Cl. 148-6.15R.

Danske Andelsslagteriers Kodfoder-og Albuminfabrik: *See*—
Madsen, Tonni B., 4,389,423, Cl. 426-417.000.

Data Motion Incorporated: *See*—
Seitz, Karl G., 4,389,007, Cl. 226-74.000.

Datta, Pabitra; Poliniak, Eugene S.; and Ban, Vladimir S., to RCA Corporation. High density information record lubricants. 4,389,441, Cl. 428-65.000.

Daubar, Valentine P.: *See*—
Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., 4,388,854, Cl. 89-46.000.

Dauphinee, Thomas M., to Canadian Patents & Development Limited. Evaporation type barometer. 4,388,829, Cl. 73-384.000.

Davey, Ernest; Hope, Lawrence L.; and Deschenes, Charles E., to GTE Products Corporation. Thin film phosphor sputtering process. 4,389,295, Cl. 204-192.00P.

Davidson, Jackson B.; and Case, Arthur L., to United States of America, Energy. Electronic method for autofluorography of macromolecules on two-D matrices. 4,389,670, Cl. 358-111.000.

Davis, Alan R.: *See*—
Richards, Elmer A.; and Davis, Alan R., 4,388,838, Cl. 74-331.000.

Dawans, Francois; Devaud, Marguerite; and Nicolas, Denise, to Institut Francais du Petrole. Method of protecting submerged articles against fouling. 4,389,460, Cl. 428-458.000.

Dawdy, James E., to Sutherland-Schultz Limited. Apparatus for detecting loss of AC power supply and loss of current. 4,389,640, Cl. 340-664.000.

Dayme, Jean-Louis: *See*—
Martinon, Gerard R.; Dayme, Jean-Louis; and Martinon, Roger J., 4,388,739, Cl. 8-150.000.

De La Mare, Harold E.; and Brownscombe, Thomas F., to Shell Oil Company. Curable polyepoxide-unsaturated monomer compositions suitable for use in rim processes. 4,389,515, Cl. 525-420.500.

Dearman, Timothy C. Pipefitters square holder. 4,388,765, Cl. 33-464.000.

Debell, John H., Jr.; and Allen, David J. Chain saw measuring device. 4,388,762, Cl. 33-185.00R.

De Bellis, Ferruccio, to S.B.M. Societa Brevetti per la Medicina S.R.L. Cardiac catheter electrodes for pacemakers provided with a cardiac RF receiver for emergency pacing. 4,388,930, Cl. 128-419.0PS.

Debesis, John R.: *See*—
Bar-on, Ari; and Debesis, John R., 4,389,654, Cl. 346-75.000.

Decker, D. Richard, to Rockwell International Corporation. High power solid state switch. 4,389,660, Cl. 357-22.000.

Deconinck, Hugo F., to AGFA-Gevaert N.V. Container suitable for holding a stack of photographic sheets. 4,388,992, Cl. 206-455.000.

De Dionigi, Manlio M., to Nicoletti, Alessandro. Pump for fluids. 4,389,169, Cl. 417-417.000.

Degen, Helmut: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,389,216, Cl. 8-639.000.

Degen, Ludwig: *See*—
Olivieri, Roberto; Fascetti, Eugenio; Ciuffolotti, Pierluigi; and Degen, Ludwig, 4,389,485, Cl. 435-191.000.

Deguchi, Yukichi: *See*—
Kitanaka, Minoru; and Deguchi, Yukichi, 4,389,453, Cl. 428-240.000.

Degussa AG: *See*—
Mobius, Olaf, 4,388,768, Cl. 36-68.000.

Degussa Aktiengesellschaft: *See*—
Werle, Peter; Merk, Wolfgang; Pohl, Gerhard; and Hoevels, Friedhelm, 4,389,333, Cl. 252-401.000.

Deibele, Florian C.; and Schell, William F., to Tektronix, Inc. Probe-actuated guard shield switch. 4,389,551, Cl. 200-51.00R.

Delamater, John R.: *See*—
Westcott, Robert F.; and Delamater, John R., 4,389,179, Cl. 425-302.100.

Deliyannides, John S.: *See*—
Gomola, John W.; Giras, Theodore C.; Wood, William G.; Putman, Richard E.; Gilbreath, Rodney E.; Deliyannides, John S.; Cullen, Terry B.; and Jones, F. David, 4,389,706, Cl. 364-130.000.

DeLoach, John R.; Harris, Robert L.; Mayery Richard T.; and Ihler, Garret M., to United States of America, Agriculture. Method of providing systemic protection from bloodsucking insects and other parasites using encapsulated additives in resealed erythrocytes. 4,389,209, Cl. 604-53.000.

Dembicki, Michael T.; and Poad, William J., to Brockway Glass Co., Inc. Preparation of glass container for thermoplastic closure. 4,389,266, Cl. 156-69.000.

Demzin, Fred W. Multiple deposition type seeder foot assembly. 4,388,878, Cl. 111-86.000.

de Nevers, Noel H.: *See*—
Gardner, James H.; and de Nevers, Noel H., 4,388,813, Cl. 62-457.000.

Dennhardt, Werner; and Heist, Hans, to Hoechst Aktiengesellschaft. Device for lifting, gripping and transporting printing plates. 4,389,156, Cl. 414-753.000.

deNora, Oronzio, to Oronzio deNora Impianti Elettrochimici S.p.A. Bipolar electrolyzer. 4,389,289, Cl. 204-128.000.

Denslow, Clark A., to Branson Ultrasonics Corporation. Method of fabricating a flexible cover by ultrasonic vibrations. 4,389,267, Cl. 156-73.200.

DeSantis, Charles M.; and Jasper, Louis J., Jr., to United States of America, Army. Active dielectric waveguide amplifier or oscillator using a high density charged particle beam. 4,389,593, Cl. 315-4.000.

De Santis, William D., to Armstrong World Industries, Inc. Scraper blades used with print rollers. 4,388,863, Cl. 101-129.000.

Deschenes, Charles E.: *See*—
Davey, Ernest; Hope, Lawrence L.; and Deschenes, Charles E., 4,389,295, Cl. 204-192.00P.

Despois, Claude; and Rebourg, Jean-Claude. Hadamard transformer using charge transfer devices. 4,389,673, Cl. 358-160.000.

Detering, Richard L., to Westinghouse Electric Corp. Automatically synchronized synchronous motor drive system. 4,389,606, Cl. 318-712.000.

Detonics Pistol Accessories, Ltd.: *See*—
Maes, Michel E., 4,388,772, Cl. 42-1.00S.

Deushi, Takeo: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.

deValpillieres, Didier J., to Bendix Corporation, The. Integral manifold absolute pressure and ambient absolute pressure sensor and associated electronics. 4,388,825, Cl. 73-115.000.

Devaud, Marguerite: *See*—
Dawans, Francois; Devaud, Marguerite; and Nicolas, Denise, 4,389,460, Cl. 428-458.000.

Devellian, Richard D.; and Swenson, Paul M., to Kona Corporation. Injection molding sozzle. 4,389,002, Cl. 222-146.0HS.

Devenyi, Tibor F.; Kovats, Tibor F. I.; and Look, Christopher M., to Northern Telecom Limited. Semiconductor laser bonding technique. 4,389,557, Cl. 219-85.0CM.

deVries, Gerhard H. F., to U.S. Philips Corporation. Method of manufacturing an electric discharge device comprising a glass substrate having a pattern of electrodes. 4,389,276, Cl. 156-630.000.

deVries, Gerhard H. F., to U.S. Philips Corporation. Method of manufacturing an electric discharge device. 4,389,277, Cl. 156-630.000.

DHV Raadgevend Ingenieursbureau BV: *See*—
Trentelman, Christiaan C. M.; van Dijk, Johannis C.; and Oomen, Johannes H. C. M., 4,389,317, Cl. 210-715.000.

Diamond, Steven E.; Mares, Frank; and Szalkiewicz, Andrew, to Allied Corporation. Selective hydrogenation of dinitrile to omega-aminonitrile and supported rhodium-containing catalyst therefor. 4,389,348, Cl. 260-465.5R.

DiBartolo, Salvatore J.: *See*—
Clark, Roland E.; DiBartolo, Salvatore J.; and Johansen, Tonny L., 4,389,080, Cl. 339-14.00R.

Dickson, James; Okazaki, Kenji; and Sanders, Thomas H., to Allied Corporation. Method for homogenizing the structure of rapidly solidified microcrystalline metal powders. 4,389,258, Cl. 148-3.000.

Dinger, Hans; and Klotz, Helmut, to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH. Internal combustion engine. 4,388,802, Cl. 60-606.000.

Dinovo, Salvatore T., to Battelle Development Corporation. Limestone calcination. 4,389,381, Cl. 423-175.000.

Di Nunzio, Vittorio: *See*—
Martinez, Pasquale; and Di Nunzio, Vittorio, 4,388,821, Cl. 73-1.00R.

Di Pardo, Robert M., to Merck & Co., Inc. Process for the resolution of some interphenylene 9-thia-11-oxo-12-azaprostanoic acids. 4,389,525, Cl. 548-187.000.

Direct Reduction Corporation, The: *See*—
Baker, Alan C.; Boulter, Geoffrey N.; and Wilbert, Daniel H., 4,389,242, Cl. 75-20.00R.

Di Schiena, Michele; and Orru, Vittoria, to Ausonia Farmaceutici s.r.l. 1,3-Thiazolidin-4-yl-carboxylic acid derivatives and antibacterial compositions thereof. 4,389,407, Cl. 424-271.000.

Dison, Gordon F.; and Dison, Henry B. Process and apparatus for storing paint brushes and the like. 4,388,767, Cl. 34-78.000.

Dison, Henry B.: *See*—
Dison, Gordon F.; and Dison, Henry B., 4,388,767, Cl. 34-78.000.

Disselbeck, Dieter; and Stahl, Dieter, to Hoechst Aktiengesellschaft. Dimensionally stable composite material and process for the manufacture thereof. 4,389,447, Cl. 428-178.000.

Dixit, Anant O.: *See*—
Chen, Chau-Shiong; and Dixit, Anant O., 4,389,255, Cl. 148-1.500.

Dobson, Jerry E.: *See*—
Won, Sungkuk; and Dobson, Jerry E., 4,389,247, Cl. 75-72.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Pantke, Reinhard; and Hofmann, Konrad, 4,388,744, Cl. 16-273.000.

Dodd, Harry D., to Gleason Works, The. Rotary tool for straddle grinding. 4,388,781, Cl. 51-206.00R.

Doellinger, Rolf; Schindler, Rudolf; and Franz, Dieter, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Rotor blade comprising a plurality of individual sections. 4,389,162, Cl. 416-225.000.

Domres, Franklin W. Cutting torch guide and accessories therefor. 4,389,039, Cl. 266-77.000.

Donachie, Stephen J.: *See*—
Erich, Donald L.; Varall, Alfred J., Jr.; and Donachie, Stephen J., 4,389,240, Cl. 75-0.50B.

Donze, Michel; and Rugi, Severino, to Etablissements Somalor-Ferrari 'Somafer'. Process for cutting metal members by means of jets of gas which issue at the periphery of a rotary disc. 4,389,261, Cl. 148-9.00R.

Dorgan, Roderick J.; and Webster, Richard A., to Beecham Group Limited. Meta-pyrazolylaminotetramisole analogs and their use in pharmaceutical compositions. 4,389,406, Cl. 424-270.000.

Dougherty, William R., to Honeywell Inc. Liquid gaging system sensor calibration. 4,388,828, Cl. 73-304.00C.

Douglas, Ted L.; Clonce, Ambrose J., Jr.; and Jones, Glenn C., to Eastman Kodak Company. Process inhibitor for readily polymerizable ethylenically unsaturated aromatic compounds. 4,389,285, Cl. 203-9.000.

Dow Chemical Company, The: *See*—
Au, Andrew T., 4,389,411, Cl. 424-301.000.
Friedli, Hans R.; Nelson, Donald L.; and Massingill, John L., Jr., 4,389,512, Cl. 525-112.000.
Priddy, Duane B.; and Roe, James M., 4,389,517, Cl. 526-64.000.

Dowdy, Edward J.; Nicholson, Nicholas; and Caldwell, John T., to United States of America, Energy. Method for monitoring irradiated nuclear fuel using Cerenkov radiation. 4,389,568, Cl. 250-362.000.

Dravo Corporation: *See*—
Jaquay, Louis H., 4,389,243, Cl. 75-23.000.

Drehman, Lewis E.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,389,305, Cl. 208-254.00H.

Dreier, Ernst, to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik. Gap stitch mechanism for sewing machines. 4,388,885, Cl. 112-221.000.

Dresser Industries, Inc.: *See*—
Palm, Michael M., 4,389,152, Cl. 414-694.000.

Drucker, David B., to Talres Development (N.A.) N.V. Methods for reducing dental caries. 4,389,394, Cl. 424-53.000.

Dubois, Gerald; and Kenel, Kaspar, to Revue Thommen AG. Clock with electric oscillator-controlled motor. 4,389,122, Cl. 368-110.000.

Dubowik, John M., to Ingersoll-Rand Company. Filter cleaning apparatus. 4,388,938, Cl. 134-104.000.

Duchac, Joseph O.: *See*—
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O., 4,388,846, Cl. 82-4.00A.

Duncan, Charles S.; Piotrowski, Paul A.; Skutch, Maria E.; and McHugh, James P., to United States of America, Energy. Apparatus for growing a dendritic web. 4,389,377, Cl. 422-246.000.

Duncan, Richard J. Failsafe coolant pump for nuclear reactor. 4,389,368, Cl. 376-283.000.

Dunn, Wendell E., Jr. Process for beneficiating titaniferous ores. 4,389,391, Cl. 423-610.000.

Duntzen, Wilhelm, to Industrietechnik Kalenborn GmbH. Overload clutch between a rope drum body and a rope drum shaft. 4,389,203, Cl. 464-34.000.

Duo-Fast Corporation: *See*—
Grikis, Raimonds; Geist, Bernard W.; and Frank, Edmund, 4,389,012, Cl. 227-120.000.

Du Pont de Nemours, E. I., and Company: *See*—
Fry, Grant C.; and Meyer, Walter C., 4,389,502, Cl. 524-37.000.
Hassall, Thomas, Jr., 4,389,506, Cl. 524-377.000.

Durand, Jacques: *See*—
Dussourd D'Hinterland, Lucien; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,389,396, Cl. 424-92.000.

Durenec, Peter, to United States of America, Army. Swash plate driving means for cryogenic coolers. 4,388,808, Cl. 62-6.000.

Durr, Dieter, to Ciba-Geigy Corporation. Herbicidal 3-phenoxymethylene-anilines. 4,389,236, Cl. 71-88.000.

Dusek, Joseph T.: *See*—
Singh, Raj N.; and Dusek, Joseph T., 4,389,467, Cl. 429-41.000.

Dussourd D'Hinterland, Lucien; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, to Pierre Fabre, S.A. Immunostimulating preparations based on ribosomal RNA's and a process for the preparation of the RNA's. 4,389,396, Cl. 424-92.000.

Dworkin, Lawrence W. Folder with pocket. 4,388,958, Cl. 150-7.000.

E.N.I. Ente Nazionale Idrocarburi: *See*—
Olivieri, Roberto; Fascetti, Eugenio; Ciuffolotti, Pierluigi; and Degen, Ludwig, 4,389,485, Cl. 435-191.000.

Eastman, Alan D.; and Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrodesulfurization or hydrodenitrogenation of organic compounds employing alumina promoted with zinc, titanium, cobalt and molybdenum as the catalytic agent. 4,389,304, Cl. 208-254.00H.

Eastman, Alan D., to Phillips Petroleum Company. Promoted zinc titanate catalyst for the dehydrogenation of organic compounds. 4,389,337, Cl. 252-462.000.

Eastman, Alan D.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,389,305, Cl. 208-254.00H.

Eastman Kodak Company: *See*—
Bishop, John F.; and Bowman, Wayne A., 4,389,479, Cl. 430-216.000.
Clark, Gary T., 4,389,531, Cl. 560-43.000.
Douglas, Ted L.; Clonce, Ambrose J., Jr.; and Jones, Glenn C., 4,389,285, Cl. 203-9.000.
Larkins, Thomas H., Jr.; and Steinmetz, Guy R., 4,389,532, Cl. 568-487.000.

Eaton Corporation: *See*—
Richards, Elmer A.; and Davis, Alan R., 4,388,838, Cl. 74-331.000.
Teeter, Terry E., 4,388,843, Cl. 74-745.000.

Eaton, Sargent S., Jr.; and Wooten, David R., to Inmos Corporation. Redundancy scheme for a dynamic RAM. 4,389,715, Cl. 365-200.000.

Ebara, Katsuya: *See*—
Nishimura, Shigeoki; Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,389,253, Cl. 134-1.000.

Eber, David H.; and Sauls, John R., to Trane Company, The. Gas compressor of the scroll type having reduced starting torque. 4,389,171, Cl. 418-15.000.

Edelson, Stuart K., to United States of America, Navy. Bowed pellet pack warhead. 4,388,870, Cl. 102-494.000.

Edison Control Corporation: *See*—
Hill, Desmond W., 4,389,643, Cl. 340-825.480.

Edison International, Inc.: *See*—
Onal, Hasan F., 4,389,160, Cl. 415-206.000.

Edleson, Stuart K., to United States of America, Navy. Rotating rod warhead. 4,388,869, Cl. 102-494.000.

Edmunds, George W.; McVeigh, George S.; and Schmitt, Werner H., to Hoppmann Corporation. Continuous rotary method of transporting articles. 4,388,989, Cl. 198-339.000.

Edson, Gerald: *See*—
Larson, Wally M., 4,388,898, Cl. 123-90.380.

EG&G Sealol, Inc.: *See*—
Johnson, Norman E.; and Greiner, Harold F., 4,389,050, Cl. 277-26.000.
Mullaney, John J., 4,389,051, Cl. 277-41.000.

Ehret, Thomas: *See*—
Carminati, Jean; Ehret, Thomas; Ovieve, Gerard; and Thoor, Henry-Albert, 4,388,948, Cl. 137-615.000.

Eisenlohr, Karl-Heinz: *See*—
Simo, Thomas; and Eisenlohr, Karl-Heinz, 4,389,303, Cl. 208-107.000.

Eisenstein, Stephen E.: *See*—
Wilson, Joe C.; Eisenstein, Stephen E.; Maxwell, Jerrold F.; and Hirozawa, Stanley T., 4,389,371, Cl. 422-15.000.

Ejiri, Yoshihiro: *See*—
Furusawa, Kahei; Ejiri, Yoshihiro; Yamazaki, Yoshihiko; Matsuzaki, Tadayoshi; Nakashima, Hiroyuki; and Harada, Osamu, 4,389,086, Cl. 350-96.200.

Ekwall, Christer; and Elmqvist, Hakan, to Siemens Aktiengesellschaft. Signal processing means particularly for heart pacemakers. 4,388,928, Cl. 128-419.0PG.

Electricite de France (Service National): *See*—
Queffelec, Corentin; Bordet, Rene; and Malinowsky, Marc (said Rene Bordet assors. to), 4,388,785, Cl. 52-222.000.

Electro-Matic Products Co.: *See*—
Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,388,792, Cl. 53-236.000.

Electrochemical Products, Inc.: *See*—
McCoy, Ewald H., 4,389,286, Cl. 204-44.000.

Elektro-Thermit GmbH: *See*—
Guntermann, Hans; Arndt, Gerhard; and Baum, Gustav, 4,389,015, Cl. 238-150.000.

Ellicson, John W.: *See*—
Thomas, Reese R.; Ellicson, John W.; and Somerville, Ronald, 4,389,443, Cl. 428-92.000.

Elmqvist, Hakan: *See*—
Ekwall, Christer; and Elmqvist, Hakan, 4,388,928, Cl. 128-419.0PG.

Eminger, Robert J., to Windamatic Systems, Inc. Flyer winder for externally slotted dynamoelectric machine core member. 4,389,023, Cl. 242-7.05B.

Ender, Erhard: *See*—
Krautz, Kurt; and Ender, Erhard, 4,388,746, Cl. 24-230.00A.

Endo, Tadakazu; and Saitoh, Shigemitsu, to Toray Industries, Inc. Method of making thick-and-thin fibers. 4,389,364, Cl. 264-167.000.

Endou, Haruo; and Ishizuka, Masao, to Mikuni Kogyo Kabushiki Kaisha. Heater for deicing carburetors. 4,389,354, Cl. 261-142.000.

Energy Development Associates, Inc.: *See*—
Bjorkman, Harry K., Jr., 4,389,468, Cl. 429-70.000.

Enertec: *See*—
Lelandais, Guy, 4,389,683, Cl. 360-65.000.

Eng, Clifford D.; Gambell, James W.; and Yuen, Henry K., to Monsanto Company. Chloroisocyanurate compositions. 4,389,325, Cl. 252-186.350.

Engelhard Corporation: *See*—
Gratzel, Michael; and Neumann-Spallart, Michael, 4,389,290, Cl. 204-128.000.

Engels, Walter, to Milliken Research Corporation. Wrinkle remover for a web of running material. 4,388,750, Cl. 26-75.000.
Enomoto, Hiromu; Yasuda, Yasushi; Mitono, Yoshiharu; Imaizumi, Taketo; and Ohmichi, Hitoshi, to Fujitsu Limited. Structure for and method of manufacturing a semiconductor device by the master slice method. 4,388,755, Cl. 29-577.00C.
Enterprises International, Inc.: *See*—
Burton, John A., 4,388,876, Cl. 110-275.000.
Epstein, Daniel; and Lieberman, Robert, to ILC Data Device Corporation. Opto-video inspection system. 4,389,669, Cl. 358-101.000.
Erich, Donald L.; Varall, Alfred J., Jr.; and Donachie, Stephen J., to Novamet, Inc. Alloying method. 4,389,240, Cl. 75-0.50B.
Erismann, David W., to Minnesota Mining and Manufacturing Company. Process for mechanically depositing heavy metallic coatings. 4,389,431, Cl. 427-242.000.
Ernst, Alfons; and Kober, Hans-Rudolf, to Johannes Heidenhain GmbH. Digital electrical angle-measuring device. 4,388,758, Cl. 33-1.0PT.
Ernst Grob, Firma: *See*—
Krapfenbauer, Hans, 4,388,818, Cl. 72-81.000.
Erwien, Helmut: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.
Esab Aktiebolag: *See*—
Weman, Klas B.; and Grohn, Hans E. A., 4,389,561, Cl. 219-124.340.
Espe Fabrik parmazeutischer Praparate GmbH: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,389,497, Cl. 523-116.000.
Estel Hoogovens B.V.: *See*—
Ferket, Florimond; and Kuenen, Cornelis A., 4,388,816, Cl. 72-11.000.
Etablissement Salgad: *See*—
Frostig, Amos, 4,388,868, Cl. 102-473.000.
Etablissements Letang & Remy: *See*—
Victor, Rene R., 4,388,817, Cl. 72-68.000.
Etablissements Somalor-Ferrari 'Somafer': *See*—
Donze, Michel; and Rugi, Severino, 4,389,261, Cl. 148-9.00R.
Ethicon, Inc.: *See*—
Shalaby, Shalaby W.; and Schipper, Edgar, 4,388,926, Cl. 128-335.500.
Eutectic Corporation: *See*—
Rotolico, Anthony J.; and Romero, Eduardo, 4,389,559, Cl. 219-121.0PP.
Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., to Springs Mills, Inc. Apparatus for sequentially fabricating pillowcases or like products. 4,388,879, Cl. 112-10.000.
Exxon Research and Engineering Co.: *See*—
McMahon, James, 4,389,657, Cl. 346-140.00R.
F. L. Smidth & Co.: *See*—
Houd, Rolf D.; and Knudsen, Hans B., 4,389,252, Cl. 106-100.000.
Fabrica D'Armi Pietro Beretta S.p.A.: *See*—
Beretta, Pier C., 4,388,773, Cl. 42-75.00B.
Fair, Delbert W., to Conoco Inc. Variable cylinder hydraulic vibrator and control system. 4,388,981, Cl. 181-119.000.
Faith, Charles M.: *See*—
Bernard, Clay, II; Matheny, William F., III; Faith, Charles M.; Goswick, Richard L.; and Hauth, Jerry L., 4,389,157, Cl. 414-787.000.
Falk, Bengt G., to Pharmacia Fine Chemicals AB. Method and a device for liquid chromatography. 4,389,316, Cl. 210-656.000.
Fanuele, Michael A.; McCray, Joseph A.; and Rittenbach, Otto F., to United States of America, Army. Doppler discrimination of aircraft targets. 4,389,647, Cl. 343-7.700.
Farha, Floyd E., Jr.: *See*—
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,389,305, Cl. 208-254.00H.
Farino, Frank G., to Leading Lady Foundations, Inc. Brassiere with improved seam. 4,388,931, Cl. 128-425.000.
Farr, Glyn P. R., to Lucas Industries Limited. Pump having membrane actuated control valve to unload slave actuated inlet valve. 4,389,167, Cl. 417-289.000.
Fascetti, Eugenio: *See*—
Olivieri, Roberto; Fascetti, Eugenio; Ciuffolotti, Pierluigi; and Degen, Ludwig, 4,389,485, Cl. 435-191.000.
Favreau, Michel, to Thomson-CSF. High definition television system. 4,389,668, Cl. 358-83.000.
Fehrenbach, Robert J., to Seaman Nuclear Corporation. Method of determining density. 4,389,136, Cl. 404-75.000.
Feit, Yoseph; Kilanowski, David R.; and Olson, Kenneth E., to American Cyanamid Company. HNCO Manufacture by catalytic oxidation of HCN with a Pd doped Ag catalyst. 4,389,386, Cl. 423-365.000.
Fell, David A.: *See*—
Maxwell, Dorothy; and Fell, David A., 4,389,503, Cl. 524-38.000.
Fenimore, Edward E., to United States of America, Energy. Coded aperture imaging with self-supporting uniformly redundant arrays. 4,389,633, Cl. 382-26.000.
Ferco S.p.A.: *See*—
Ferri, Beniamino; and Caimi, Giovanni, 4,389,272, Cl. 156-297.000.
Ferket, Florimond; and Kuenen, Cornelis A., to Estel Hoogovens B.V. Method and apparatus for rolling a length of metal bar or wire. 4,388,816, Cl. 72-11.000.
Fernsler, Ronald E.: *See*—
Balaban, Alvin R.; Steckler, Steven A.; and Fernsler, Ronald E., 4,389,676, Cl. 358-243.000.
Ferranti plc: *See*—
Bell, Melvyn R.; Morrison, John M.; and Stewart, Charles M., 4,389,697, Cl. 361-380.000.
Ferri, Beniamino; and Caimi, Giovanni, to Ferco S.p.A. Process and feeding device to provide consecutive series of small objects on a single plane. 4,389,272, Cl. 156-297.000.
Fiat Auto S.p.A.: *See*—
Martinez, Pasquale; and Di Nunzio, Vittorio, 4,388,821, Cl. 73-1.00R.
Fichter, Manfred, to Kienzle Apparate GmbH. Line recording device. 4,389,653, Cl. 346-49.000.
Filley, Charles C. Mental harmonization process. 4,388,918, Cl. 128-1.00C.
Fior, Claude. Suspension system for cycles and in particular for motorcycles. 4,388,978, Cl. 180-219.000.
Fischbeck, Kenneth H., to Xerox Corporation. Bidirectional ink jet printing. 4,389,652, Cl. 346-1.100.
Fischer & Porter Company: *See*—
Schmoock, Roy F., 4,388,834, Cl. 73-861.120.
Fisher, William B.: *See*—
James, Leonard E.; Crescentini, Lamberto; and Fisher, William B., 4,389,339, Cl. 252-472.000.
Flair, Henry J.; and Rayburn, Charles C., to Illinois Tool Works Inc. Indexing mechanism for card acceptor. 4,389,564, Cl. 235-489.000.
Florida Data Corporation: *See*—
Bellinger, James E., 4,389,127, Cl. 400-124.000.
Floyd, Thomas D.; Nelson, Roland D.; and Bonagura, Ronald L., to Consolidated Micrographics, Inc. Microfiche separator and transport apparatus. 4,389,117, Cl. 355-87.000.
FMC Corporation: *See*—
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,389,528, Cl. 549-470.000.
Carminati, Jean; Ehret, Thomas; Ovieve, Gerard; and Thoor, Henry-Albert, 4,388,948, Cl. 137-615.000.
Focke, Heinz H.; and Liedtke, Kurt W., to Focke & Pfuhl. Apparatus for cutting and transporting blanks from a web of flexible material. 4,388,794, Cl. 53-389.000.
Focke & Pfuhl: *See*—
Focke, Heinz H.; and Liedtke, Kurt W., 4,388,794, Cl. 53-389.000.
Fohl, Artur, to REPA Feinstanzwerk GmbH. Braking-and/or blocking device for load carrying flexible pulling means, for example, belts or ropes. 4,388,985, Cl. 188-65.400.
Ford Motor Company: *See*—
Gandhi, Haren S.; and Adams, Karen M., 4,389,382, Cl. 423-213.500.
Forest Laboratories, Inc.: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., 4,389,393, Cl. 424-19.000.
Foshee, William R., to Best Lock Corporation. Mortise lock with improved deadlock release mechanism. 4,389,061, Cl. 292-169.140.
Fossi, Paolo: *See*—
Rouillard epouse Bauer, Denise; Cote, Gerard; Fossi, Paolo; and Marchon, Bruno, 4,389,379, Cl. 423-89.000.
Foster, David L.; Haupt, John F.; and Waite, Malcolm W., to General Electric Company. Electric wheel with removable motor. 4,389,586, Cl. 310-67.00R.
Fournier, Rene; and Sainte-Foi, Daniel. Apparatus for making fibers from thermoplastic materials. 4,389,232, Cl. 65-16.000.
Frank, Edmund: *See*—
Grikis, Raimonds; Geist, Bernard W.; and Frank, Edmund, 4,389,012, Cl. 227-120.000.
Franke, Werner; and Seibel, Markus, to Hoechst Aktiengesellschaft. Light-sensitive layer transfer material. 4,389,480, Cl. 430-271.000.
Franklin, Jerry C., to Lockwood Technical, Inc. Interface control circuit for multiple hot melt material supply systems. 4,389,001, Cl. 222-63.000.
Franz, Dieter: *See*—
Doellinger, Rolf; Schindler, Rudolf; and Franz, Dieter, 4,389,162, Cl. 416-225.000.
Frappart, Pierre: *See*—
Morel, Gilbert; Frappart, Pierre; and Saint Marcoux, Roland, 4,389,703, Cl. 363-61.000.
Fraser, Bruce A.: *See*—
Yannascoli, Donald; and Fraser, Bruce A., 4,389,168, Cl. 417-298.000.
Frattarola, Joseph R; Hudgin, Richard H.; and Yachik, Theodore R., to Itek Corporation. High information density laser image recording method and apparatus. 4,389,712, Cl. 365-127.000.
Frazer-Nash Limited: *See*—
Griffin, Denis; and Adie, John F., 4,388,853, Cl. 89-1.50F.
Freeman, James D. Hanger-type ceiling-attachable support having self-dispensing cement. 4,389,035, Cl. 248-542.000.
Freeman, Willie B., to Westinghouse Electric Corp. Transformer protective switch. 4,389,554, Cl. 200-148.00A.
French, Barry T.; and McNutt, Michael J., to Rockwell International Corporation. CCD Demodulator circuit. 4,389,615, Cl. 329-101.000.
French, David M.: *See*—
Tompa, Albert S.; French, David M.; and White, Billy R., 4,389,265, Cl. 149-109.600.
Frick, Richard H., to Kimberly-Clark Corporation. Wide band extruder nozzle. 4,389,181, Cl. 425-461.000.
Fridrich, Elmer G.: *See*—
Hansler, Richard L.; and Fridrich, Elmer G., 4,389,201, Cl. 445-26.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Ulrich, Klaus; Janssen, Wilhelm; and Herbrig, Reinhard, 4,389,040, Cl. 266-137.000.

Friedli, Hans R.; Nelson, Donald L.; and Massingill, John L., Jr., to Dow Chemical Co., The. Cycloaliphatic acrylate compositions. 4,389,512, Cl. 525-112.000.

Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See*—
Dreier, Ernst, 4,388,885, Cl. 112-221.000.
Ruch, Urs; and Ulmer, Christian, 4,388,887, Cl. 112-279.000.

Fritzenwenger, Josef, to Bayerische Motoren Werke Aktiengesellschaft. Motorcycle power train arrangement. 4,388,979, Cl. 180-226.000.

Frostig, Amos, to Etablissement Salgad. Shell body for fin-stabilized projectiles. 4,388,868, Cl. 102-473.000.

Fry, Grant C.; and Meyer, Walter C., to Du Pont de Nemours, E. I., and Company. Clear air-dry acrylic lacquer coating composition. 4,389,502, Cl. 524-37.000.

Fryer, Richard H.: *See*—
Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., 4,388,854, Cl. 89-46.000.

Fuhrhop, Ronald E., to Union Carbide Corporation. Scarfing apparatus. 4,389,038, Cl. 266-51.000.

Fuji Electric Co. Ltd.: *See*—
Tago, Keiichiro, 4,389,646, Cl. 340-870.370.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kurihara, Toshiro, 4,388,905, Cl. 123-440.000.
Umezawa, Mitsuo, 4,388,986, Cl. 188-77.00R.

Fuji Photo Film Co., Ltd.: *See*—
Asao, Yasuzi, 4,389,455, Cl. 428-328.000.
Kawamura, Kouichi; Sato, Hideo; and Katsuyama, Harumi, 4,389,474, Cl. 430-37.000.
Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, 4,389,477, Cl. 430-81.000.
Oishi, Kengo; Moriwaki, Masayoshi; Suzuki, Osamu; and Kamiyama, Kouji, 4,389,010, Cl. 226-196.000.
Oishi, Kengo; Suzuki, Osamu; and Komiyama, Choji, 4,389,690, Cl. 360-132.000.

Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo, 4,389,565, Cl. 250-201.000.

Fujieda, Takanori: *See*—
Nigorikawa, Atsushi; Yokoyama, Hiroshi; and Fujieda, Takanori, 4,389,723, Cl. 371-27.000.

Fujii, Takara: *See*—
Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, 4,389,268, Cl. 156-150.000.

Fujikawa, Yoshiyuki: *See*—
Nakanishi, Yasuhiro; and Fujikawa, Yoshiyuki, 4,389,641, Cl. 340-709.000.

Fujimura, Akira: *See*—
Suda, Kazuyoshi; Fujimura, Akira; and Tsuda, Kiyoshi, 4,388,994, Cl. 209-564.000.

Fujioka, Hironari; and Matsubayashi, Hajime, to Kanzaki Paper Manufacturing Company, Ltd. Electrostatic record material. 4,389,451, Cl. 428-212.000.

Fujita, Masao: *See*—
Iyama, Yukio; Fujita, Masao; and Higashiiriki, Nobuhiro, 4,389,044, Cl. 266-271.000.

Fujita, Susumu: *See*—
Horikoshi, Ichiro; Murakami, Fumikazu; Hara, Yoshiaki; Fujita, Susumu; and Ide, Osamu, 4,389,123, Cl. 368-250.000.

Fujitsu Limited: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Mitono, Yoshiharu; Imaizumi, Taketo; and Ohmichi, Hitoshi, 4,388,755, Cl. 29-577.00C.

Fukai, Masakazu: *See*—
Hori, Yoshikazu; Asai, Komei; and Fukai, Masakazu, 4,389,096, Cl. 350-339.00R.

Fukuroi, Takeo, to Yoshida Kogyo K. K. Method and apparatus for manufacturing slide fastener coupling elements. 4,388,751, Cl. 29-410.000.

Fukushima, Syousuke, to Konishiroku Photo Industry Co., Ltd. Zoom lens barrel. 4,389,098, Cl. 350-429.000.

Fuller, Robert L.: *See*—
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O., 4,388,846, Cl. 82-4.00A.

Furusawa, Kahei; Ejiri, Yoshihiro; Yamazaki, Yoshihiko; Matsuzaki, Tadayoshi; Nakashima, Hiroyuki; and Harada, Osamu, to Kokusai Denshin Denwa Co., Ltd.; and Nippon Electric Co., Ltd. Feedthrough terminal comprising a guide member defined for at least one optical fiber cable between a tube and a rod. 4,389,086, Cl. 350-96.200.

Furuta, Kenzi, to Olympus Optical Co., Ltd. Cue signal generating system. 4,389,685, Cl. 360-72.200.

Furuya, Katuji; and Yago, Tokuzo, to Nissan Motor Company, Limited. System for rapidly warming up catalytic converter provided to automotive internal combustion engine. 4,388,803, Cl. 60-284.000.

Futatsuishi, Godo, to Nippon Electric Co., Ltd. Phase locked loop stabilized against temperature and voltage variations. 4,389,621, Cl. 331-1.00A.

G.D. Searle & Co.: *See*—
Lenz, George R., 4,389,345, Cl. 260-397.100.

Gaines, George L., Jr.; and Ward, William J., III, to General Electric Company. Fugitive binder-containing nuclear fuel material and method of production. 4,389,341, Cl. 252-638.000.

Gallagher, Edward L., to A-T-O, Inc. Interfacing attachment for remote mechanical fire alarms. 4,389,635, Cl. 340-287.000.

Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., to Bendix Corporation, The. Electrical connector coupling ring. 4,389,081, Cl. 339-89.00M.

Gambell, James W.: *See*—
Eng, Clifford D.; Gambell, James W.; and Yuen, Henry K., 4,389,325, Cl. 252-186.350.

Gamble, Christopher L. Load balancing device. 4,388,841, Cl. 74-573.00F.

Gancy, Alan B. Process of making two uniform grades of calcium magnesium acetate. 4,389,323, Cl. 252-70.000.

Gander, Franz. Watercraft with swivel fin drive. 4,389,196, Cl. 440-15.000.

Gandhi, Haren S.; and Adams, Karen M., to Ford Motor Company. Method of using a simplified low cost catalyst system. 4,389,382, Cl. 423-213.500.

Gannon, John A., to Ciba-Geigy Corporation. Advancement catalysts for epoxy resins. 4,389,520, Cl. 528-89.000.

Gardner, James H.; and de Nevers, Noel H., to Aurora Design Associates, Inc. Server for wine bottles and the like. 4,388,813, Cl. 62-457.000.

Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., to Phillips Petroleum Company. Catalytic hydrodenitrogenation of organic compounds employing promoted zinc titanate. 4,389,305, Cl. 208-254.00H.

Gardner, Lloyd E.: *See*—
Eastman, Alan D.; and Gardner, Lloyd E., 4,389,304, Cl. 208-254.00H.

Garnaud, Guy; and Bouhier, Roger, to Medica-Test. Apparatus for automatically measuring the viscosity of liquids. 4,388,823, Cl. 73-57.000.

Garrett, David: *See*—
Molayem, Benjamin; and Garrett, David, 4,388,877, Cl. 110-342.000.

Garwin, Leo; and Baldwin, Roger A., to Kerr-McGee Refining Corporation. Process for vis-breaking asphaltenes. 4,389,302, Cl. 208-86.000.

Gassler, Kurt. Construction means for use in the assembly of wall and/or roof structures. 4,388,786, Cl. 52-282.000.

Gates, James T. Humidifying system for mobile vehicles. 4,389,353, Cl. 261-130.000.

Gaylord, Norman G.: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., 4,389,393, Cl. 424-19.000.

Gaz de France: *See*—
Guilhem, Michel, 4,388,810, Cl. 62-47.000.

Geberth, John D., Jr. Spray gun. 4,389,017, Cl. 239-455.000.

GEC-General Signal Limited: *See*—
Hardman, Arthur R., 4,389,033, Cl. 246-37.000.

Geipel, Henry J., Jr.; Hsieh, Ning; Koburger, Charles W., III; and Nesbit, Larry A., to International Business Machines Corporation. Fabrication method for high conductivity, void-free polysilicon-silicide integrated circuit electrodes. 4,389,257, Cl. 148-1.500.

Geist, Bernard W.: *See*—
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Clark, Roland E.; DiBartolo, Salvatore J.; and Johansen, Tonny L., 4,389,080, Cl. 339-14.00R.

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Burns, Richard D., 4,388,756, Cl. 29-598.000.
Burns, Richard D., 4,389,584, Cl. 310-43.000.
Cooper, Glenn D.; and Katchman, Arthur, 4,389,511, Cl. 525-68.000.
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Gaines, George L., Jr.; and Ward, William J., III, 4,389,341, Cl. 252-638.000.
Hamsler, Richard L.; and Fridrich, Elmer G., 4,389,201, Cl. 445-26.000.
Pauze, Denis R.; and Zamek, Otto S., 4,389,457, Cl. 428-379.000.
Sherman, Ira N., 4,388,831, Cl. 73-623.000.
Stark, Charles J., 4,389,529, Cl. 549-531.000.

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Hudak, Stephen F., 4,389,422, Cl. 426-388.000.

Genese, Joseph N., to Abbott Laboratories. Catheter placement assembly having axial and rotational alignment means. 4,389,210, Cl. 604-177.000.

Georgia-Pacific Corporation: *See*—
Hall, Richard A.; and Sorensen, James R., 4,389,013, Cl. 229-45.00R.

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Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., 4,388,854, Cl. 89-46.000.

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Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.
Trumper, Thomas, 4,389,073, Cl. 299-45.000.

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Toll, Alexander R.; and Gibboni, Roland R., 4,389,194, Cl. 434-201.000.

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Gidlund, Per A. L., to Atlas Copco Aktiebolag. Vibrationless impact tool. 4,388,972, Cl. 173-162.00R.

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Simmonds, Michael B.; and Giffard, Robin P., 4,389,612, Cl. 324-248.000.

Gilbreath, Rodney E.: *See*—
Gomola, John W.; Giras, Theodore C.; Wood, William G.; Putman, Richard E.; Gilbreath, Rodney E.; Deliyannides, John S.; Cullen, Terry B.; and Jones, F. David, 4,389,706, Cl. 364-130.000.

Giles, Albert H.: *See*—
Mirra, Michael J.; and Giles, Albert H., 4,389,459, Cl. 428-457.000.

Gillette Company, The: *See*—
Riesgraf, Diane A., 4,389,499, Cl. 523-161.000.

Gilloire, Andre: *See*—
Le Guyader, Alain; and Gilloire, Andre, 4,389,726, Cl. 375-27.000.

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Valentine, Roy H.; and Brandman, Harold A., 4,389,527, Cl. 549-438.000.

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Dodd, Harry D., 4,388,781, Cl. 51-206.00R.

Glisson, David; Huber, Gerald; and Biskey, Bruce, to Audichron Company, The. Digital announcement system including remote loading and interrogation. 4,389,546, Cl. 179-18.00B.

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Godley, Fred O.; and Laurents, John A., to Single Vend Inc. Newspaper vending machine. 4,389,000, Cl. 221-8.000.

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Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,389,020, Cl. 241-24.000.

Goodyear Aerospace Corporation: *See*—
Rasmussen, John P., 4,389,710, Cl. 364-551.000.

Gordon, John H. Mandrel with identical expanding segments. 4,389,180, Cl. 425-403.000.

Gorike, Rudolf, to AKG Akustische u. Kino-Ger/ te. Orthodynamic headphone. 4,389,542, Cl. 179-1.00R.

Gorove, Arpad, to Storage Technology Corporation. Exhaust air valve for magnetic disk drives. 4,389,687, Cl. 360-98.000.

Goswick, Richard L.: *See*—
Bernard, Clay, II; Matheny, William F., III; Faith, Charles M.; Goswick, Richard L.; and Hauth, Jerry L., 4,389,157, Cl. 414-787.000.

Grabley, Susanne; and Sauber, Klaus, to Hoechst Aktiengesellschaft. Process for the enzymatic preparation of L-2-amino-4-methylphosphinobutyric acid. 4,389,488, Cl. 435-280.000.

Graiff, Leonard B.; Heldeweg, Rudolf F.; and Leenaars, Corrie M. J., to Shell Oil Company. Gasoline composition and method for reducing fuel consumption. 4,389,221, Cl. 44-66.000.

Gramling, William D. Special effects editing method and apparatus using retrieved video. 4,389,680, Cl. 360-14.100.

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Gratzel, Michael; and Neumann-Spallart, Michael, to Engelhard Corporation. Use of electrocatalytic anodes in photolysis. 4,389,290, Cl. 204-128.000.

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Patchett, Gilbert G.; Gray, Reed A.; and Hyzak, Daniel L., 4,389,237, Cl. 71-103.000.

Greco, Michael. Partition and paneling system. 4,388,790, Cl. 52-584.000.

Green, Donald L., to Beecham Products. Patterned dryer added fabric conditioning articles. 4,389,448, Cl. 428-195.000.

Green, Peter C.: *See*—
Block, Jacob; and Green, Peter C., 4,389,319, Cl. 252-8.50A.

Greene, Neil E.: *See*—
Shofner, Frederick M.; Greene, Neil E.; and Hanna, Terry J., 4,389,574, Cl. 250-561.000.

Greenfield, Mark S., to GTE Products Corporation. Mine tools utilizing copper-manganese nickel brazing alloys. 4,389,074, Cl. 299-79.000.

Gregory, Floyd A.: *See*—
Boyanowski, Robert E.; Gregory, Floyd A.; and Nemier, Stanley E., 4,389,008, Cl. 226-123.000.

Greiner, Harold F.: *See*—
Johnson, Norman E.; and Greiner, Harold F., 4,389,050, Cl. 277-26.000.

Greskovich, Eugene J.: *See*—
Dalton, Augustine I., Jr.; Greskovich, Eugene J.; and Skinner, Ronald W., 4,389,390, Cl. 423-584.000.

Gries, Josef: *See*—
May, Hans-Joachim; Lenke, Dieter; Gries, Josef; Teschemdorf, Hans-Juergen; and Worstmann, Wolfgang, 4,389,403, Cl. 424-258.000.

Griffin, Denis; and Adie, John F., to Frazer-Nash Limited. Missile launchers. 4,388,853, Cl. 89-1.50F.

Griffith, Michael J., to Curtiss-Wright Corporation. Rotary compressor or expansion engine of hypotrochoidal configuration and angularly displaced gear means. 4,389,172, Cl. 418-61.00A.

Grikis, Raimonds; Geist, Bernard W.; and Frank, Edmund, to Duo-Fast Corporation. Fastener tool loading assembly. 4,389,012, Cl. 227-120.000.

Grime, Thomas E., to Champion Spark Plug Company. Vent for paint cups. 4,388,997, Cl. 220-209.000.

Grimm, Gerold; Rose, Klaus; Kemmner, Ulrich; Schillinger, Rainer; and Stemmer, Alois, to Robert Bosch GmbH. Adjustment device for rotary angle adjustment. 4,388,913, Cl. 123-585.000.

Grohn, Hans E. A.: *See*—
Weman, Klas B.; and Grohn, Hans E. A., 4,389,561, Cl. 219-124.340.

Grumman Aerospace Corporation: *See*—
Hudson, Gordon F., 4,389,367, Cl. 264-570.000.

Grundken, Dieter: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.

GTE Products Corporation: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 4,389,700, Cl. 362-306.000.
Davey, Ernest; Hope, Lawrence L.; and Deschenes, Charles E., 4,389,295, Cl. 204-192.00P.
Greenfield, Mark S., 4,389,074, Cl. 299-79.000.

Guenette, Louis D.: *See*—
Weir, Roy; Morin, Larry G.; and Guenette, Louis D., 4,389,066, Cl. 296-19.000.

Guilhem, Michel, to Gaz de France. Storage tank for liquefied gas such as methane. 4,388,810, Cl. 62-47.000.

Guinan, Thomas, to Heinemann Electric Company. Circuit breaker with increased electrical spacing. 4,389,555, Cl. 200-303.000.

Gulf Canada Limited: *See*—
McCorriston, Lois L., 4,389,378, Cl. 423-68.000.

Gulf Oil Corporation: *See*—
Dancs, Tibor, 4,389,149, Cl. 414-382.000.

Gunjima, Tomoki: *See*—
Suhara, Manabu; Gunjima, Tomoki; and Miyake, Haruhisa, 4,389,494, Cl. 521-27.000.

Guntermann, Hans; Arndt, Gerhard; and Baum, Gustav, to Elektro-Thermit GmbH. Corrugation-free rail. 4,389,015, Cl. 238-150.000.

Gushurst, Fred W., Jr. Adjustable airfoil. 4,388,888, Cl. 114-90.000.

Guzik, Rudolph, to Bell & Howell Company. Apparatus for and methods of making bimodal electrophotographic copies. 4,389,478, Cl. 430-97.000.

Haas, Frederick T., Jr., to Mod-Sod Sports Surfaces, Inc. Top dressed plating surface with resilient underpad. 4,389,435, Cl. 428-17.000.

Hackenberg, Robert A.: *See*—
Berry, Chapman; and Hackenberg, Robert A., 4,388,999, Cl. 220-416.000.

Hackforth GmbH & Co. KG: *See*—
Walter, Jurgen, 4,389,204, Cl. 464-91.000.

Hada, Takashi: *See*—
Honma, Yoshikiyo; Shimogawara, Jun; Nagata, Muneyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, 4,389,126, Cl. 400-82.000.

Haga, Shoji: *See*—
Arai, Hajime; and Haga, Shoji, 4,388,844, Cl. 74-752.00C.

Hagenmuller, Paul: *See*—
Tanguy, Bernard; Soubeyroux, Jean-Louis; Pezat, Michel; Portier, Josik; and Hagenmuller, Paul, 4,389,326, Cl. 252-188.260.

Haghighi, Kamal Banani: *See*—
Breon, Everett C., 4,388,741, Cl. 15-104.3SN.

Hagiwara, Yukio: *See*—
Sugiyama, Takahiro; and Hagiwara, Yukio, 4,389,100, Cl. 350-478.000.

Hajost, Mark J.; Crevling, Robert L.; and Powell, Fred B., to Professional Medical Products, Inc. Variable position knee immobilizer. 4,388,920, Cl. 128-80.00C.

Halbleib, Chester W.: *See*—
Lonsinger, Jack J.; and Halbleib, Chester W., 4,389,350, Cl. 260-989.000.

Hall, Lawrence W. Rotary exercise device. 4,389,047, Cl. 272-69.000.

Hall, Richard A.; and Sorensen, James R., to Georgia-Pacific Corporation. Container having a self-locking lid. 4,389,013, Cl. 229-45.00R.

Halliburton Company: *See*—
Brandell, John T., 4,388,968, Cl. 166-236.000.

Hamada, Osamu, to Sony Corporation. Signal processing system. 4,388,849, Cl. 84-1.180.

Hamanaka, Nobuyuki; Hashimoto, Shinsuke; and Hayashi, Masaki. 9,11-Methano-13-aza-11a-carbathrombanoic acid analogues. 4,389,413, Cl. 424-305.000.

Hamane, Takuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Coil winding apparatus. 4,388,952, Cl. 140-92.100.

Hammann, Ingeborg: *See*—
Arlt, Dieter; Homeyer, Bernhard; and Hammann, Ingeborg, 4,389,530, Cl. 556-404.000.

Hammer, Jeffrey M.: *See*—
Anderson, Paul A.; Hammer, Jeffrey M.; and MacArthur, J. Ward, 4,389,577, Cl. 307-39.000.

Hamshar, John A., III: *See*—
Goforth, Charles P.; and Hamshar, John A., III, 4,389,388, Cl. 423-461.000.

Hanamoto, Mark S.; and Tanaka, Steve K., to Bio-Rad Laboratories, Inc. Method and kit for chromatographic separation of hemoglobin $A_{1c}$. 4,389,491, Cl. 436-67.000.

Hancart, Jules: *See*—
Tusset, Vittorino; Hancart, Jules; and Paulus, Philippe, 4,389,254, Cl. 134-3.000.

Hancock, Harold E., to Power Management Corporation. Solid state arc suppression device. 4,389,691, Cl. 361-8.000.

Handy, Binns; and Chase, David O., to Lenox, Incorporated. Soft container for jewelry. 4,388,959, Cl. 150-52.00R.

Hanna, Terry J.: *See*—
Shofner, Frederick M.; Greene, Neil E.; and Hanna, Terry J., 4,389,574, Cl. 250-561.000.

Hannart, Jean A., to Omnichem, S.A. 1,10-Dimethyl-2,7-dihydroxoayohimbanes an anti-arrhythmic use thereof. 4,389,405, Cl. 424-262.000.

Hansen, Guenter: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,389,216, Cl. 8-639.000.

Hansler, Richard L.; and Fridrich, Elmer G., to General Electric Company. Method of manufacturing a lamp. 4,389,201, Cl. 445-26.000.

Hara, Akinori; and Mochizuki, Hiroshi, to Osawa Press Mdg., Co., Ltd. Method of and apparatus for twisting wire end. 4,388,953, Cl. 140-149.000.

Hara, Akio: *See*—
Nakai, Tetsuo; Kono, Yuichiro; Yazu, Shuji; and Hara, Akio, 4,389,465, Cl. 428-698.000.

Hara, Yoshiaki: *See*—
Horikoshi, Ichiro; Murakami, Fumikazu; Hara, Yoshiaki; Fujita, Susumu; and Ide, Osamu, 4,389,123, Cl. 368-250.000.

Harada, Kazuo: *See*—
Nakanishi, Takeshi; Harada, Kazuo; Yoshida, Nobuyuki; and Ogino, Etsuo, 4,389,306, Cl. 209-5.000.

Harada, Masato; Suzuki, Atsushi; Yamada, Sadahiko; and Masuda, Jun, to Chisso Corporation. Process for producing polyethylene. 4,389,518, Cl. 526-97.000.

Harada, Osamu: *See*—
Furusawa, Kahei; Ejiri, Yoshihiro; Yamazaki, Yoshihiko; Matsuzaki, Tadayoshi; Nakashima, Hiroyuki; and Harada, Osamu, 4,389,086, Cl. 350-96.200.

Haraguchi, Shosuke: *See*—
Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; Tosaka, Yoichi; and Haraguchi, Shosuke, 4,389,111, Cl. 354-173.000.

Harbormaster, Division of Mathewson Corp.: *See*—
Henderson, Ronald C., 4,389,198, Cl. 440-60.000.

Hard, Robert A., to Occidental Research Corporation. Process for reducing phosphate ore. 4,389,384, Cl. 423-304.000.

Harding, Maurice J. C.: *See*—
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,389,528, Cl. 549-470.000.

Hardman, Arthur R., to GEC-General Signal Limited. Broken rail/-bond detectors. 4,389,033, Cl. 246-37.000.

Harju, Philip H.; and Pasek, Eugene A., to Koppers Company, Inc. Preparation of naphthalene-oxidation catalyst by impregnation of silica with aqueous solution of $VOC_2O_4$—$K_2SO_4$—$KHSO_4$. 4,389,336, Cl. 252-440.000.

Harris Corporation: *See*—
Patel, Vipin N.; and Raby, Joseph S., 4,389,713, Cl. 365-163.000.
Posner, Ronald S.; Burr, Charles R., Jr.; and Campbell, David K., 4,389,671, Cl. 358-124.000.
Young, William R.; and Zepp, Stanley R., 4,389,721, Cl. 370-88.000.

Harris, Robert L.: *See*—
DeLoach, John R.; Harris, Robert L.; Mayery Richard T.; and Ihler, Garret M., 4,389,209, Cl. 604-53.000.

Hartmann, Kurt: *See*—
Bohg, Armin; and Hartmann, Kurt, 4,388,861, Cl. 101-93.020.

Harvey, Barrie J.; and Willson, Robert C., to M. H. Detrick Co., Ltd. Refractory components for furnaces. 4,389,189, Cl. 432-247.000.

Harvey, Gerald J.; and Huff, Elliot, Jr., to Harvey-Westbury Corp. Self-contained portable air compressor. 4,389,166, Cl. 417-234.000.

Harvey-Westbury Corp.: *See*—
Harvey, Gerald J.; and Huff, Elliot, Jr., 4,389,166, Cl. 417-234.000.

Hasegawa, Hiroshi, to Dai Nippon Insatsu Kabushiki Kaisha. Production of semiprocessed fried potato pieces for preservation at room temperature. 4,389,424, Cl. 426-546.000.

Hasegawa, Katsuji, to Mienan Machinery Works, Inc. Method of patch mending a veneer sheet. 4,388,956, Cl. 144-332.000.

Hashimoto, Akihiko: *See*—
Kimura, Tadashi; Hashimoto, Akihiko; and Kidawara, Atsushi, 4,389,566, Cl. 250-204.000.

Hashimoto, Shinsuke: *See*—
Hamanaka, Nobuyuki; Hashimoto, Shinsuke; and Hayashi, Masaki, 4,389,413, Cl. 424-305.000.

Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece with alarm function. 4,389,121, Cl. 368-63.000.

Hassall, Thomas, Jr., to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol dust suppression by admixing polyglycol. 4,389,506, Cl. 524-377.000.

Hatch, Charles E., III: *See*—
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,389,528, Cl. 549-470.000.

Hatco Corporation: *See*—
Chaudoir, Roderick J., 4,389,562, Cl. 219-388.000.

Hattori, Hiroyuki; and Uemura, Kazuo, to Shimadzu Corporation. Emission computed tomograph. 4,389,569, Cl. 250-363.00S.

Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; Rothkegel, Josef; and Volling, Gudrun, to Occidental Chemical Corporation. Composition and process for the phosphatizing of metals. 4,389,260, Cl. 148-6.15Z.

Haupt, John F.: *See*—
Foster, David L.; Haupt, John F.; and Waite, Malcolm W., 4,389,586, Cl. 310-67.00R.

Hauth, Jerry L.: *See*—
Bernard, Clay, II; Matheny, William F., III; Faith, Charles M.; Goswick, Richard L.; and Hauth, Jerry L., 4,389,157, Cl. 414-787.000.

Hayashi, Kazuo, to Nissan Motor Co., Ltd. Rotary vane pump with passage to the rotor and housing interface. 4,389,170, Cl. 418-15.000.

Hayashi, Masaki: *See*—
Hamanaka, Nobuyuki; Hashimoto, Shinsuke; and Hayashi, Masaki, 4,389,413, Cl. 424-305.000.

Hayashi, Motokazu: *See*—
Kamei, Taketo; and Hayashi, Motokazu, 4,389,595, Cl. 315-57.000.

Heimreid, Ken. External urinary drainage device. 4,388,923, Cl. 128-295.000.

Heinemann Electric Company: *See*—
Guinan, Thomas, 4,389,555, Cl. 200-303.000.

Heinemans, Hendricus C. A. M.: *See*—
Van de Donk, Michael J. C.; Heinemans, Hendricus C. A. M.; and Legierse, Petrus E. J., 4,389,719, Cl. 369-275.000.

Heist, Hans: *See*—
Dennhardt, Werner; and Heist, Hans, 4,389,156, Cl. 414-753.000.

Heldeweg, Rudolf F.: *See*—
Graiff, Leonard B.; Heldeweg, Rudolf F.; and Leenaars, Corrie M. J., 4,389,221, Cl. 44-66.000.

Heller, Herbert, to Mine Safety Appliances Company. Atmospheric sampling system. 4,388,822, Cl. 73-23.000.

Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, to Lincoln Manufacturing Co., Inc. Lid handle cover. 4,388,743, Cl. 16-116.00A.

Hellstab, Stephan, to Hugo Sachs Elektronik KG. Multiple electrode system. 4,389,656, Cl. 346-139.00C.

Hemmer, Valentine J.: *See*—
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,389,081, Cl. 339-89.00M.

Henderson, Clifford W. Scriber. 4,388,761, Cl. 33-42.000.

Henderson, Ronald C., to Harbormaster, Division of Mathewson Corp. Outboard motor system. 4,389,198, Cl. 440-60.000.

Hendry, James W., to KMMCO Structural Foam, Inc. Method and apparatus for making an integral structural cellular and non-cellular plastic or resinous article with a smooth outer surface. 4,389,358, Cl. 264-45.100.

Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., to International Harvester Co. Hydromechanical transmission employing lockup clutch. 4,388,987, Cl. 192-3.260.

Herbrig, Reinhard: *See*—
Ulrich, Klaus; Janssen, Wilhelm; and Herbrig, Reinhard, 4,389,040, Cl. 266-137.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Gersbeck, Rolf, 4,389,182, Cl. 425-505.000.

Hermann, Carl Z.; and Locke, Timothy L. Toy sailplane. 4,388,777, Cl. 46-79.000.

Hermes, Glenn P. Template guide. 4,388,764, Cl. 33-403.000.

Hesse, Jurgen: *See*—
Hoesslin, Gerhard V.; and Hesse, Jurgen, 4,389,366, Cl. 264-558.000.

Higaki, Yuzo: *See*—
Yamada, Osamu; Higaki, Yuzo; and Ukai, Akitoshi, 4,389,346, Cl. 260-410.700.

Higashiiriki, Nobuhiro: *See*—
Iyama, Yukio; Fujita, Masao; and Higashiiriki, Nobuhiro, 4,389,044, Cl. 266-271.000.

Higashiyama, Noboru, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head supporting mechanism. 4,389,688, Cl. 360-104.000.

Higgins, John T., to Cominco Ltd. Sulfur prilling. 4,389,356, Cl. 264-9.000.

Hill, Desmond W., to Edison Control Corporation. Multiplexed pulse tone signal receiving apparatus. 4,389,643, Cl. 340-825.480.

Hiraga, Hirofumi; Yoshimura, Minoru; Ikeda, Shigeho; and Yoshii, Hiroe, to Ajinomoto Company Incorporated. Method for producing L-glutamic acid by fermentation. 4,389,483, Cl. 435-110.000.

Hirano, Takashi, to Yamato Scale Company, Ltd. Combination weighing device. 4,388,975, Cl. 177-25.000.

Hiraoka, Hiroyuki: *See*—
Bargon, Joachim; Hiraoka, Hiroyuki; and Welsh, Lawrence W., Jr., 4,389,482, Cl. 430-325.000.

Hiraoka, Shoji: *See*—
Watanabe, Taisuke; Niyada, Katsuyuki; Hiraoka, Shoji; and Kaga, Kenji, 4,389,539, Cl. 179-1.0SM.

Hirata, Goichi: *See*—
Samejima, Masayoshi; Hirata, Goichi; and Koida, Yoshiyuki, 4,389,331, Cl. 427-213.300.

Hirata, Takeyuki: *See*—
Okamura, Shozo; Nakajima, Hidemasa; Marukawa, Katsukiyo; Anezaki, Shoji; and Hirata, Takeyuki, 4,389,246, Cl. 75-60.000.

Hirate, Masayuki: *See*—
Morikawa, Eiji; Morita, Toshifumi; and Hirate, Masayuki, 4,389,548, Cl. 179-110.00A.

Hirmann, Georg: *See*—
Knibichler, Ernst; and Hirmann, Georg, 4,389,709, Cl. 364-551.000.

Hirose, Yasuo. Evaporating concentrator for sewage sludge. 4,388,875, Cl. 110-224.000.

Hirota, Kunio; and Shimomura, Masao, to Brother Kogyo Kabushiki Kaisha. Stitch pattern sewing machine. 4,388,883, Cl. 112-121.120.

Hirota, Kunio; and Shimomura, Masao, to Brother Kogyo Kabushiki Kaisha. Stitch pattern sewing machine. 4,388,884, Cl. 112-121.120.

Hirozawa, Stanley T.: *See*—
Wilson, Joe C.; Eisenstein, Stephen E.; Maxwell, Jerrold F.; and Hirozawa, Stanley T., 4,389,371, Cl. 422-15.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Aihara, Toshiharu, 4,389,684, Cl. 360-71.000.

Hitachi, Ltd.: *See*—
Hoshi, Yoshikazu, 4,388,900, Cl. 123-198.0DB.
Hotta, Masao; Miyamoto, Yoshikazu; Yokozawa, Norio; and Oshima, Yoshimitsu, 4,389,711, Cl. 364-556.000.
Nishimura, Shigeoki; Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,389,253, Cl. 134-1.000.
Seki, Katsumi; Tachi, Yasuo; and Shibata, Yoji, 4,389,310, Cl. 210-183.000.
Sekiyama, Nobuo; and Miyamura, Hisato, 4,389,607, Cl. 318-717.000.
Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, 4,389,184, Cl. 431-15.000.
Yamaguchi, Kiyoshi; Maki, Naoki; and Tamura, Toshio, 4,389,585, Cl. 310-52.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
Nakanishi, Takeshi; Harada, Kazuo; Yoshida, Nobuyuki; and Ogino, Etsuo, 4,389,306, Cl. 209-5.000.

Hitt, James J.; and Kern, Scott L., to Leeds & Northrup Company. Preamplifier for low voltage signals in the presence of high voltage noise. 4,389,674, Cl. 358-213.000.

Ho, Andrew W., to Chevron Research Company. 2,2-Bis(haloalkenyl)-1-substituted-1-cyanoethylene fungicides. 4,389,400, Cl. 424-248.520.

Hobbs, John R., to Rolls-Royce Limited. Gas turbine engine air intake. 4,389,227, Cl. 55-306.000.

Hobein, Dietmar: *See*—
Horacek, Heinrich; Marx, Matthias; and Hobein, Dietmar, 4,389,454, Cl. 428-318.600.

Hoch, Samuel: *See*—
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,389,328, Cl. 252-194.000.

Hochreuter, Johann. Shearing pin moment of rotation limiting arrangement for two constructional units that are rotatable relative to one another. 4,389,202, Cl. 464-33.000.

Hoechst Aktiengesellschaft: *See*—
Dennhardt, Werner; and Heist, Hans, 4,389,156, Cl. 414-753.000.
Disselbeck, Dieter; and Stahl, Dieter, 4,389,447, Cl. 428-178.000.
Franke, Werner; and Seibel, Markus, 4,389,480, Cl. 430-271.000.
Grabley, Susanne; and Sauber, Klaus, 4,389,488, Cl. 435-280.000.
Schneider, Manfred; Kruse, Hubert; and Opitz, Konrad, 4,389,213, Cl. 8-524.000.

Hoesslin, Gerhard V.; and Hesse, Jurgen, to Messer Griesheim GmbH. Process and device for cooling hollow synthetic material profiles. 4,389,366, Cl. 264-558.000.

Hoevels, Friedhelm: *See*—
Werle, Peter; Merk, Wolfgang; Pohl, Gerhard; and Hoevels, Friedhelm, 4,389,333, Cl. 252-401.000.

Hoffmann, Gerhard; and Neumann, Peter, to BASF Aktiengesellschaft. Multilayered electrophotographic recording medium. 4,389,475, Cl. 430-58.000.

Hoffmann, Karlheinz: *See*—
Thoma, Frank; Hoffmann, Karlheinz; and Seiler, Gunter, 4,389,018, Cl. 239-533.300.

Hoffmann-La Roche Inc.: *See*—
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,389,329, Cl. 252-299.100.
Horecker, Bernard L., 4,389,343, Cl. 260-112.50R.

Hofmann, Konrad: *See*—
Pantke, Reinhard; and Hofmann, Konrad, 4,388,744, Cl. 16-273.000.

Hofmeister, Hagen, to Licentia Patent-Verwaltungs-GmbH. Method for the simultaneous transmission of a plurality of data stream over one transmission channel. 4,389,722, Cl. 370-100.000.

Hofmeister, Hagen: *See*—
Gockler, Heinz; and Hofmeister, Hagen, 4,389,616, Cl. 329-104.000.

Hogg, Cecil B.: *See*—
Merriam, Jay S.; and Hogg, Cecil B., 4,389,335, Cl. 252-439.000.

Holaday, Veldon D., Jr.: *See*—
Thornton, Thomas A.; and Holaday, Veldon D., Jr., 4,389,355, Cl. 264-0.500.

Holowaty, Michael O.; Hughes, Ian F.; and Lude, John, to Inland Steel Company. Method for adding ingredient to steel as shot. 4,389,249, Cl. 75-129.000.

Homeyer, Bernhard: *See*—
Arlt, Dieter; Homeyer, Bernhard; and Hammann, Ingeborg, 4,389,530, Cl. 556-404.000.

Honeywell Inc.: *See*—
Anderson, Paul A.; Hammer, Jeffrey M.; and MacArthur, J. Ward, 4,389,577, Cl. 307-39.000.
Dougherty, William R., 4,388,828, Cl. 73-304.00C.
Kackman, Gerald M., 4,389,622, Cl. 332-19.000.
Tamura, Poohsan N., 4,389,092, Cl. 350-162.120.

Honjo, Shuichi: *See*—
Naka, Akihiro; and Honjo, Shuichi, 4,389,219, Cl. 44-51.000.

Honma, Keizo; and Honma, Kunizo, to Honma, Keizo. Device for capturing air bubbles from fluids in piping. 4,388,944, Cl. 137-171.000.

Honma, Kunizo: *See*—
Honma, Keizo; and Honma, Kunizo, 4,388,944, Cl. 137-171.000.

Honma, Yoshikiyo; Shimogawara, Jun; Nagata, Muneyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, to Nippon Electric Co., Ltd. Serial impact printer having two printing modes. 4,389,126, Cl. 400-82.000.

Hope, Lawrence L.: *See*—
Davey, Ernest; Hope, Lawrence L.; and Deschenes, Charles E., 4,389,295, Cl. 204-192.00P.

Hoppmann Corporation: *See*—
Edmunds, George W.; McVeigh, George S.; and Schmitt, Werner H., 4,388,989, Cl. 198-339.000.

Horacek, Heinrich; Marx, Matthias; and Hobein, Dietmar, to BASF Aktiengesellschaft. Molded foamed polyurethane part having a lightweight skin and a process for its manufacture. 4,389,454, Cl. 428-318.600.

Horecker, Bernard L., to Hoffmann-La Roche Inc. Immunopotentiating peptides from thymus. 4,389,343, Cl. 260-112.50R.

Hori, Yoshikazu; Asai, Komei; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Image display apparatus of liquid crystal valve projection type. 4,389,096, Cl. 350-339.00R.

Horie, Izumi: *See*—
Yuasa, Yoshio; Ishikawa, Norio; and Horie, Izumi, 4,389,118, Cl. 356-404.000.

Horie, Katuo: *See*—
Kojima, Sadao; Shimada, Masaaki; Sakai, Kunio; and Horie, Katuo, 4,389,376, Cl. 422-228.000.

Horiguchi, Satoru; and Sasaoka, Takeshi, to Dai Nippon Printing Co. Ltd.; and Ikegami Tsushinki Co. Ltd. Flying spot scanner for use in a color printing process simulating apparatus. 4,389,667, Cl. 358-75.000.

Horikoshi, Ichiro; Murakami, Fumikazu; Hara, Yoshiaki; Fujita, Susumu; and Ide, Osamu, to Kabushiki Kaisha Daini Seikosha. Electronic alarm watch. 4,389,123, Cl. 368-250.000.

Horodysky, Andrew G., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,389,322, Cl. 252-49.600.

Hosaka, Akihiko; and Okuyama, Kiyotaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,389,458, Cl. 428-425.900.

Hoshi, Yoshikazu, to Hitachi, Ltd. Automatic stopping device for diesel engine. 4,388,900, Cl. 123-198.0DB.

Hoskinson, William R.; Carley, Joseph C.; and Ippolito, Anthony C., to Wurlitzer Company, The. Non-volatile memory system for an electronic musical instrument. 4,388,851, Cl. 84-1.240.

Hosoya, Yukiyoshi: *See*—
Honma, Yoshikiyo; Shimogawara, Jun; Nagata, Muneyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, 4,389,126, Cl. 400-82.000.

Hotta, Masao; Miyamoto, Yoshikazu; Yokozawa, Norio; and Oshima, Yoshimitsu, to Hitachi, Ltd. Touch sensitive tablet using force detection. 4,389,711, Cl. 364-556.000.

Houd, Rolf D.; and Knudsen, Hans B., to F. L. Smidth & Co. Plant for manufacturing cement clinker. 4,389,252, Cl. 106-100.000.

Hough, Harold L.: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 4,389,700, Cl. 362-306.000.

Houle, Roberta C.: *See*—
Yong, Samuel H.; Perlbachs, Donna J.; Wallin, Glenn R.; and Houle, Roberta C., 4,389,420, Cl. 426-94.000.

Hsieh, Ning: *See*—
Geipel, Henry J., Jr.; Hsieh, Ning; Koburger, Charles W., III; and Nesbit, Larry A., 4,389,257, Cl. 148-1.500.

Hsu, Wen-Liang: *See*—
Shore, Sheldon G.; and Hsu, Wen-Liang, 4,389,347, Cl. 260-429.0CY.

Huber, Gerald: *See*—
Glisson, David; Huber, Gerald; and Biskey, Bruce, 4,389,546, Cl. 179-18.00B.

Hubner, Heinz-Joachim: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,389,497, Cl. 523-116.000.
Hudak, Stephen F., to General Foods Corporation. Method for producing aromatized microporous substrates. 4,389,422, Cl. 426-388.000.
Hudgin, Richard H.: *See*—
Frattarola, Joseph R; Hudgin, Richard H.; and Yachik, Theodore R., 4,389,712, Cl. 365-127.000.
Hudson, Gordon F., to Grumman Aerospace Corporation. Fluid molding system. 4,389,367, Cl. 264-570.000.
Huff, Elliot, Jr.: *See*—
Harvey, Gerald J.; and Huff, Elliot, Jr., 4,389,166, Cl. 417-234.000.
Hughes, Ian F.: *See*—
Holowaty, Michael O.; Hughes, Ian F.; and Lude, John, 4,389,249, Cl. 75-129.000.
Hugo Sachs Elektronik KG: *See*—
Hellstab, Stephan, 4,389,656, Cl. 346-139.00C.
Hundertmark, James M.: *See*—
Sheridan, Stephen E.; and Hundertmark, James M., 4,388,896, Cl. 123-73.0AD.
Hungerford, Gordon P., to Mobil Oil Corporation. Boil resistant film laminate and retortable food pouch therefrom. 4,389,437, Cl. 428-35.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Plasticized polyacrylonitrile, a film thereof and a process for film preparation and plasticization. 4,389,505, Cl. 524-376.000.
Hurley, Raymond: *See*—
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,389,328, Cl. 252-194.000.
Hutcheon, Ronald M., to Canada, Atomic Energy of, Limited. Two magnet asymmetric doubly achromatic beam deflection system. 4,389,572, Cl. 250-396.00R.
Hydronautics, Inc.: *See*—
Johnson, Virgil E., Jr.; and Lindenmuth, William T., 4,389,071, Cl. 299-14.000.
Hyzak, Daniel L.: *See*—
Patchett, Gilbert G.; Gray, Reed A.; and Hyzak, Daniel L., 4,389,237, Cl. 71-103.000.
Ibau Hamburg Ingenieurgesellschaft Industriebau mbH: *See*—
Klein-Albenhausen, Heinrich, 4,389,142, Cl. 406-120.000.
Ide, Osamu: *See*—
Horikoshi, Ichiro; Murakami, Fumikazu; Hara, Yoshiaki; Fujita, Susumu; and Ide, Osamu, 4,389,123, Cl. 368-250.000.
Igarashi, Sachio: *See*—
Yamazaki, Kyuya; Igarashi, Sachio; and Shibata, Koichi, 4,389,519, Cl. 528-73.000.
Ihler, Garret M.: *See*—
DeLoach, John R.; Harris, Robert L.; Mayery Richard T.; and Ihler, Garret M., 4,389,209, Cl. 604-53.000.
Iio, Toshimasa; and Ohkubo, Toyokazu, to Sumitomo Metal Mining Company Limited. Method of recovering gold from anode slimes. 4,389,248, Cl. 75-99.000.
Ikeda, Kunihiko: *See*—
Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, 4,389,113, Cl. 355-3.0DD.
Ikeda, Shigeho: *See*—
Hiraga, Hirofumi; Yoshimura, Minoru; Ikeda, Shigeho; and Yoshii, Hiroe, 4,389,483, Cl. 435-110.000.
Ikeda, Shoji: *See*—
Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, 4,389,408, Cl. 424-271.000.
Ikegami Tsushinki Co. Ltd.: *See*—
Horiguchi, Satoru; and Sasaoka, Takeshi, 4,389,667, Cl. 358-75.000.
ILC Data Device Corporation: *See*—
Epstein, Daniel; and Lieberman, Robert, 4,389,669, Cl. 358-101.000.
Illinois Tool Works Inc.: *See*—
Flair, Henry J.; and Rayburn, Charles C., 4,389,564, Cl. 235-489.000.
Ilon, Bengt E. Skid protection device for wheels. 4,388,754, Cl. 29-446.000.
Imai, Susumu: *See*—
Yanabu, Satoru; Nishiwaki, Susumu; Yamashita, Mizuho; Satoh, Toshikazu; Murakami, Yoichi; and Imai, Susumu, 4,389,693, Cl. 361-127.000.
Imai, Toshihiro, to Olympus Optical Co., Ltd. Photographic lens system. 4,389,099, Cl. 350-464.000.
Imaizumi, Taketo: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Mitono, Yoshiharu; Imaizumi, Taketo; and Ohmichi, Hitoshi, 4,388,755, Cl. 29-577.00C.
Inden, Toshikazu: *See*—
Uesugi, Toshiaki; and Inden, Toshikazu, 4,389,627, Cl. 335-206.000.
Industrias Y Confecciones, S.A. (INDUYCO): *See*—
Blasco, Eduardo G., 4,389,604, Cl. 318-568.000.
Industrietechnik Kalenborn GmbH: *See*—
Duntzen, Wilhelm, 4,389,203, Cl. 464-34.000.
Ingersoll-Rand Company: *See*—
Dubowik, John M., 4,388,938, Cl. 134-104.000.
Inland Steel Company: *See*—
Holowaty, Michael O.; Hughes, Ian F.; and Lude, John, 4,389,249, Cl. 75-129.000.
Inmos Corporation: *See*—
Eaton, Sargent S., Jr.; and Wooten, David R., 4,389,715, Cl. 365-200.000.
Innis, Charles L., Jr.; Salter, Lowell S., Jr.; Boghosian, Harry; and Wilkinson, Donald H., to Morgan Construction Company. Water guard for rolling mill oil film bearing. 4,389,053, Cl. 277-95.000.
Inoue, Yoshio; and Shimizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Method of improving adhesion and adhesion improvers used therefor. 4,389,432, Cl. 427-299.000.
Institut Francais du Petrole: *See*—
Dawans, Francois; Devaud, Marguerite; and Nicolas, Denise, 4,389,460, Cl. 428-458.000.
Institut Straumann AG: *See*—
Sutter, Franz; and Straumann, Fritz, 4,388,921, Cl. 128-92.00B.
Intermedics Cardiassist Corporation: *See*—
Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., 4,388,919, Cl. 128-64.000.
International Business Machines Corporation: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Lechaton, John S.; and Walsh, James L., 4,389,281, Cl. 156-646.000.
Anantha, Narasipur G.; Bhatia, Harsaran S.; Mauer, John L., IV; and Sarkary, Homi G., 4,389,294, Cl. 204-192.00E.
Bargon, Joachim; Hiraoka, Hiroyuki; and Welsh, Lawrence W., Jr., 4,389,482, Cl. 430-325.000.
Bohg, Armin; and Hartmann, Kurt, 4,388,861, Cl. 101-93.020.
Boyanowski, Robert E.; Gregory, Floyd A.; and Nemier, Stanley E., 4,389,008, Cl. 226-123.000.
Geipel, Henry J., Jr.; Hsieh, Ning; Koburger, Charles W., III; and Nesbit, Larry A., 4,389,257, Cl. 148-1.500.
Milligan, Charles A.; and Winarski, Daniel J., 4,389,600, Cl. 318-6.000.
Staiger, Dieter E., 4,389,614, Cl. 328-61.000.
International Computers Limited: *See*—
Scarrott, Gordon G., 4,389,682, Cl. 360-45.000.
International Harvester Co.: *See*—
Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., 4,388,987, Cl. 192-3.260.
International Minerals & Chemical Corp.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Varnum, Nancy C., 4,389,498, Cl. 523-139.000.
International Minerals & Chemical Luxembourg Societe Anonyme: *See*—
Lask, Gert-Wilhelm, 4,389,493, Cl. 501-154.000.
International Rectifier Corporation: *See*—
Clemente, Stefano; Pelly, Brian R.; and Ruttonsha, Rutton, 4,389,702, Cl. 363-21.000.
International Telephone and Telegraph Corporation: *See*—
Bartels, Leroy R.; and Milbright, Arnold M., 4,388,983, Cl. 182-189.000.
McDuffee, Frederick T.; and Kozikowski, Carrie L., 4,389,428, Cl. 427-54.100.
Milbright, Arnold M., 4,388,787, Cl. 52-298.000.
Ionescu, Marian I.; Lenker, Jay A.; Rosenbluth, Robert F.; and Seiler, Louis, Jr., to Shiley Inc. Low profile prosthetic xenograft heart valve. 4,388,735, Cl. 3-1.500.
Ippolito, Anthony C.: *See*—
Hoskinson, William R.; Carley, Joseph C.; and Ippolito, Anthony C., 4,388,851, Cl. 84-1.240.
Isaka, Takenobu; and Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. Tracking apparatus for use in a video tape recorder. 4,389,686, Cl. 360-77.000.
Ishida, Tokuji: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, 4,389,109, Cl. 354-60.00L.
Ishikawa, Norio: *See*—
Yuasa, Yoshio; Ishikawa, Norio; and Horie, Izumi, 4,389,118, Cl. 356-404.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Shimizu, Masami; and Yasunobe, Junji, 4,389,052, Cl. 277-67.000.
Ishino, Hirokichi: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Yamasoba, Takahiko; Tsuchiko, Susumu; and Yoshino, Takashi, 4,389,438, Cl. 428-35.000.
Ishizuka, Masao: *See*—
Endou, Haruo; and Ishizuka, Masao, 4,389,354, Cl. 261-142.000.
Itek Corporation: *See*—
Frattarola, Joseph R; Hudgin, Richard H.; and Yachik, Theodore R., 4,389,712, Cl. 365-127.000.
Ito, Hisakatsu: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.
Ito, Kazuomi: *See*—
Nishizawa, Jun-ichi; and Ito, Kazuomi, 4,389,256, Cl. 148-1.500.
Ito, Masao: *See*—
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, 4,388,903, Cl. 123-440.000.
Ito, Susumu: *See*—
Ban, Mikichi; and Ito, Susumu, 4,389,084, Cl. 350-524.000.
Itoh, Tadatsugu, to Anelva Corporation. Pulsed electron beam device comprising a cathode having through holes. 4,389,573, Cl. 250-492.200.
ITT Industries, Inc.: *See*—
Ostwald, Fritz, 4,389,076, Cl. 303-92.000.
Iwasaki, Akio: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.

Iwasaki, Koichi: *See*—
Wada, Makoto; Iwasaki, Koichi; and Nakata, Hajime, 4,388,960, Cl. 152-209.00R.

Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Pulse duty control system. 4,389,581, Cl. 307-419.000.

Iwata, Shigemi: *See*—
Kajiyama, Ryuichi; and Iwata, Shigemi, 4,389,631, Cl. 340-21.000.

Iyada, Syozo: *See*—
Ubukata, Susumu; Mizutani, Yasukazu; and Iyada, Syozo, 4,389,630, Cl. 337-363.000.

Iyama, Yukio; Fujita, Masao; and Higashiiriki, Nobuhiro, to Nippon Mining Co., Ltd. Mechanical punching apparatus for copper smelting converter. 4,389,044, Cl. 266-271.000.

J. I. Case Company: *See*—
Bushmeyer, Richard W., 4,388,804, Cl. 60-319.000.
Pedersen, Carl O.; and Maurer, Herman J., 4,389,153, Cl. 414-695.500.

J. T. Baker Chemical Company: *See*—
Kaufman, Harold A., 4,389,238, Cl. 71-115.000.

Jabor, Tony. Light switch delay circuit. 4,389,599, Cl. 315-360.000.

Jackson, David W., to Probe Systems, Inc. Method and apparatus for coherent detection in optical processors. 4,389,093, Cl. 350-162.140.

Jacobson, Sava. Remote rewind mechanism and control circuitry for a tape cassette telephone answering device. 4,389,545, Cl. 179-6.070.

James, Leonard E.; Crescentini, Lamberto; and Fisher, William B., to Allied Corporation. Process for making a cobalt oxide catalyst. 4,389,339, Cl. 252-472.000.

James River-Dixie/Northern, Inc.: *See*—
Sakschek, Helmut W., 4,389,175, Cl. 425-82.100.

Jamesbury Corporation: *See*—
Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, 4,388,945, Cl. 137-315.000.

Jang, Sei-Joo; Pohl, Knut D.; and Saifi, Mansoor A., to Western Electric Co., Inc. Methods and apparatus for fabricating a lightguide preform. 4,389,229, Cl. 65-3.120.

Jansen, Friedrich L.; and Phillips, Ian, to U.S. Philips Corporation. Telephone set. 4,389,547, Cl. 179-81.00R.

Janssen, Wilhelm: *See*—
Ulrich, Klaus; Janssen, Wilhelm; and Herbrig, Reinhard, 4,389,040, Cl. 266-137.000.

Jaquay, Louis H., to Dravo Corporation. Method for the flash oxidation of metal concentrates. 4,389,243, Cl. 75-23.000.

Jason, Andrew: *See*—
Granirer, Martus; and Jason, Andrew, 4,389,543, Cl. 179-2.00B.

Jasper, Louis J., Jr.: *See*—
DeSantis, Charles M.; and Jasper, Louis J., Jr., 4,389,593, Cl. 315-4.000.

Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Thermal break skylight. 4,388,784, Cl. 52-200.000.

Jochum, Peter: *See*—
Schmitt, Werner; Parrmann, Robert; Jochum, Peter; and Hubner, Heinz-Joachim, 4,389,497, Cl. 523-116.000.

Jocteur, Robert: *See*—
Bendayan, Jacques; and Jocteur, Robert, 4,389,087, Cl. 350-96.230.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons; and Kober, Hans-Rudolf, 4,388,758, Cl. 33-1.0PT.

Johansen, Tonny L.: *See*—
Clark, Roland E.; DiBartolo, Salvatore J.; and Johansen, Tonny L., 4,389,080, Cl. 339-14.00R.

John Fluke Mfg. Co., Inc.: *See*—
Baldock, K. Paul, 4,389,708, Cl. 364-573.000.

Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, to Jamesbury Corporation. Valve assembly and disassembly device. 4,388,945, Cl. 137-315.000.

Johnson & Johnson: *See*—
Korpman, Ralf, 4,389,444, Cl. 428-137.000.

Johnson, Norman E.; and Greiner, Harold F., to EG&G Sealol, Inc. Mechanical seal having a seal insert mounted in a laminated shell. 4,389,050, Cl. 277-26.000.

Johnson, Virgil E., Jr.; and Lindenmuth, William T., to Hydronautics, Inc. Enhancing liquid jet erosion. 4,389,071, Cl. 299-14.000.

Jones, Emrys H., Jr.; and Thakur, Pramod C., to Conoco Inc. Variable diameter drill rod stabilizer. 4,388,974, Cl. 175-325.000.

Jones, F. David: *See*—
Gomola, John W.; Giras, Theodore C.; Wood, William G.; Putman, Richard E.; Gilbreath, Rodney E.; Deliyannides, John S.; Cullen, Terry B.; and Jones, F. David, 4,389,706, Cl. 364-130.000.

Jones, Glenn C.: *See*—
Douglas, Ted L.; Clonce, Ambrose J., Jr.; and Jones, Glenn C., 4,389,285, Cl. 203-9.000.

Joy, Richard W., to United States of America, Energy. Rapidly refuelable fuel cell. 4,389,466, Cl. 429-27.000.

Jung, Lothar. Burner for manufacture of fused quartz or fused silica ingots. 4,389,235, Cl. 65-302.000.

K. R. Komarek, Inc.: *See*—
Komarek, Karl R., 4,389,178, Cl. 425-237.000.

Kabushiki Kaisha Cubic Engineering: *See*—
Nakanishi, Motoyasu, 4,388,866, Cl. 101-426.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Horikoshi, Ichiro; Murakami, Fumikazu; Hara, Yoshiaki; Fujita, Susumu; and Ide, Osamu, 4,389,123, Cl. 368-250.000.

Kabushiki Kaisha Hokushin Denki Seisakusho: *See*—
Kuwayama, Hideki, 4,388,833, Cl. 73-718.000.

Kackman, Gerald M., to Honeywell Inc. System for preventing transient induced errors in phase locked loop. 4,389,622, Cl. 332-19.000.

Kaga, Kenji: *See*—
Watanabe, Taisuke; Niyada, Katsuyuki; Hiraoka, Shoji; and Kaga, Kenji, 4,389,539, Cl. 179-1.05M.

Kahn, William M. Digital matrix switching. 4,389,642, Cl. 340-825.030.

Kai, Kazuo. Method for manufacturing circuit board with through hole. 4,389,278, Cl. 156-630.000.

Kaji, Hisatsugu: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,389,387, Cl. 423-447.700.

Kajiyama, Ryuichi; and Iwata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Elevator position detecting device. 4,389,631, Cl. 340-21.000.

Kakimoto, Michiyuki: *See*—
Nozawa, Tetuo; Nagata, Jun; and Kakimoto, Michiyuki, 4,389,556, Cl. 219-64.000.

Kalivretenos, Chris A.; and Brown, Michael A., to United States of America, Navy. Flat trajectory projectile. 4,389,028, Cl. 244-3.210.

Kalka, Josef: *See*—
Boeke, Burkhard; Kalka, Josef; Smolinski, Manfred; and Baukholt, Heinz, 4,389,522, Cl. 528-503.000.

Kamardin, Alexei M.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Kamath, Bola R., to ABC Sunray Corporation. Gas burner injector head. 4,389,188, Cl. 431-284.000.

Kamei, Taketo; and Hayashi, Motokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Fluorescent lamp. 4,389,595, Cl. 315-57.000.

Kameyama, Iwao: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,389,387, Cl. 423-447.700.

Kamide, Kenji: *See*—
Okajima, Kunihiko; Kamide, Kenji; and Matsui, Toshihiko, 4,389,523, Cl. 536-59.000.

Kamiya, Kazuhiro: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.

Kamiyama, Kouji: *See*—
Oishi, Kengo; Moriwaki, Masayoshi; Suzuki, Osamu; and Kamiyama, Kouji, 4,389,010, Cl. 226-196.000.

Kanebo Ltd.: *See*—
Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, 4,389,408, Cl. 424-271.000.

Kanzaki Paper Manufacturing Company, Ltd.: *See*—
Fujioka, Hironari; and Matsubayashi, Hajime, 4,389,451, Cl. 428-212.000.

Karaputadze, Temuri M.: *See*—
Zhorov, Vladimor I.; Kirsh, Jury E.; Shumsky, Viktor I.; Karaputadze, Temuri M.; and Bairamov, Jury J., 4,389,404, Cl. 424-260.000.

Kasahara, Takao: *See*—
Teshima, Toru; Ariga, Kazuo; and Kasahara, Takao, 4,389,095, Cl. 350-334.000.

Kasamura, Toshirou, to Canon Kabushiki Kaisha. Sheet feeding mechanism for image forming apparatus. 4,389,046, Cl. 271-227.000.

Katchman, Arthur: *See*—
Cooper, Glenn D.; and Katchman, Arthur, 4,389,511, Cl. 525-68.000.

Kato, Shoji: *See*—
Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, 4,389,268, Cl. 156-150.000.

Katsuyama, Harumi: *See*—
Kawamura, Kouichi; Sato, Hideo; and Katsuyama, Harumi, 4,389,474, Cl. 430-37.000.

Kaufman, Harold A., to J. T. Baker Chemical Company. Flowable herbicide and pesticide formulation. 4,389,238, Cl. 71-115.000.

Kaule, Walter, to Krautkramer-Branson, Inc. Method and apparatus for receiving ultrasonic waves by optical means. 4,388,832, Cl. 73-655.000.

Kawai, Yujio: *See*—
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, 4,388,903, Cl. 123-440.000.

Kawamura, Kouichi; Sato, Hideo; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Thiopyrylium compounds and photoconductive compositions containing said compounds. 4,389,474, Cl. 430-37.000.

Kawamura, Masaharu, to Canon Kabushiki Kaisha. Battery check device. 4,389,609, Cl. 320-48.000.

Kawamura, Yoshio, to Agency for Industrial Science & Technology, Ministry of International Trade & Industry. Combustion apparatus. 4,389,186, Cl. 431-173.000.

Kawasaki Motors Corp.: *See*—
Marcell, Gerald V., 4,388,842, Cl. 74-710.500.

Kawasaki, Teruo: *See*—
Kogawa, Kouichi; Kawasaki, Teruo; and Mimura, Akitoshi, 4,389,603, Cl. 318-443.000.

Keith, Roger H., to Minnesota Mining & Manufacturing Company. Torque preloaded elastic cover for torque coupling. 4,389,440, Cl. 428-36.000.

Keller & Bohacek GmbH & Co., KG.: *See*—
Keller, Renate, 4,389,324, Cl. 252-180.000.

Keller, Renate, to Keller & Bobacek GmbH & Co., KG. Polymeric composition for preventing the formation of scale during vaporation of sugar juices. 4,389,324, Cl. 252-180.000.

Kellner, Phillip R., to Crosfield Electronics Limited. Printing layer of urethane and acetyl polymers and method of making. 4,388,865, Cl. 101-401.100.

Kemmner, Ulrich: *See*—
Grimm, Gerold; Rose, Klaus; Kemmner, Ulrich; Schillinger, Rainer; and Stemmer, Alois, 4,388,913, Cl. 123-585.000.

Kenel, Kaspar: *See*—
Dubois, Gerald; and Kenel, Kaspar, 4,389,122, Cl. 368-110.000.

Kennedy, Robert J., Jr.: *See*—
Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,388,743, Cl. 16-116.00A.

Kent, John S., to Syntex (U.S.A.) Inc. Prostaglandin compositions. 4,389,414, Cl. 424-308.000.

Kercher, Paul W.: *See*—
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., 4,389,313, Cl. 210-198.200.

Kerklies, Bodo: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.

Kermer, Wolf-Dieter: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,389,216, Cl. 8-639.000.

Kern, Scott L.: *See*—
Hitt, James J.; and Kern, Scott L., 4,389,674, Cl. 358-213.000.

Kernforschungsanlage Julich GmbH: *See*—
Klatt, Karl-Heinz; Pietz, Siegfried; and Wenzl, Helmut, 4,389,239, Cl. 75-0.50R.

Kerr-McGee Refining Corporation: *See*—
Garwin, Leo; and Baldwin, Roger A., 4,389,302, Cl. 208-86.000.

Kesper, Bernt: *See*—
Moller, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, 4,389,226, Cl. 55-208.000.

Khoe, Giok D.; Meuleman, Lambertus J.; and Rozzi, Tullio E., to U.S. Philips Corporation. Semiconductor switching device for guiding and amplifying radiation. 4,389,567, Cl. 250-213.00R.

Kidawara, Atsushi: *See*—
Kimura, Tadashi; Hashimoto, Akihiko; and Kidawara, Atsushi, 4,389,566, Cl. 250-204.000.

Kiddie Products, Inc.: *See*—
Panicci, Richard L., 4,388,996, Cl. 220-70.000.

Kienzle Apparate GmbH: *See*—
Fichter, Manfred, 4,389,653, Cl. 346-49.000.

Kihira, Masafumi: *See*—
Hamane, Takuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,388,952, Cl. 140-92.100.

Kilanowski, David R.: *See*—
Feit, Yoseph; Kilanowski, David R.; and Olson, Kenneth E., 4,389,386, Cl. 423-365.000.

Kimber, Edward G.; and Norris, Peter C., to Tridon Limited. Retainer clip and retainer clip backing member combination for windshield wiper blade assemblies. 4,388,742, Cl. 15-250.420.

Kimberly-Clark Corporation: *See*—
Frick, Richard H., 4,389,181, Cl. 425-461.000.

Kimura, Tadashi; Hashimoto, Akihiko; and Kidawara, Atsushi, to Olympus Optical Co., Ltd. Automatic focusing apparatus for cameras. 4,389,566, Cl. 250-204.000.

Kimura, Yoshiyuki; Shiobara, Masaji; and Yoshiba, Yasutaka, to Nissan Motor Company, Limited. Exhaust gas recirculation control system for a diesel engine. 4,388,912, Cl. 123-569.000.

Kinoshita, Toshio: *See*—
Hamane, Takuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,388,952, Cl. 140-92.100.

Kinzer, Charles E.: *See*—
Palmer, James K.; and Kinzer, Charles E., 4,388,827, Cl. 73-302.000.

Kirchherr, Patricia R.: *See*—
Pickens, Robert C., Jr.; Kirchherr, Patricia R.; and Thomas, Reese R., 4,389,442, Cl. 428-92.000.

Kirsh, Jury E.: *See*—
Zhorov, Vladimor I.; Kirsh, Jury E.; Shumsky, Viktor I.; Karaputadze, Temuri M.; and Bairamov, Jury J., 4,389,404, Cl. 424-260.000.

Kishi, Norimasa; and Yamamuro, Shigeaki, to Nissan Motor Co., Ltd. Line pressure control device of an automatic transmission. 4,388,845, Cl. 74-862.000.

Kitai, Kiyoshi; Saito, Takeo; Segawa, Takashi; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Device for detecting coincident focusing points. 4,389,105, Cl. 354-25.000.

Kitanaka, Minoru; and Deguchi, Yukichi, to Toray Industries, Inc. Reinforced polyphenylene sulfide molded board, printed circuit board including this molded board and process for preparation thereof. 4,389,453, Cl. 428-240.000.

Kite, William C., to Lee, Earl J. Arcuate piston rotary engine. 4,389,173, Cl. 418-146.000.

Klatt, Karl-Heinz; Pietz, Siegfried; and Wenzl, Helmut, to Kernforschungsanlage Julich GmbH. Method and pressure container for producing hydrogen-storage metal granulates. 4,389,239, Cl. 75-0.50R.

Klein-Albenhausen, Heinrich, to Ibau Hamburg Ingenieurgesellschaft Industriebau mbH. Silo system for floury loose materials, particularly cement. 4,389,142, Cl. 406-120.000.

Klockner-Humboldt-Deutz AG: *See*—
Megerle, Friedrich, 4,389,041, Cl. 266-194.000.

Klohn, Wolfgang H. R.; Muller, Dieter H.; and Schubert, Hiltmar A. O., to s.a. PRB, societe anonyme. Process for the manufacture of insulated propellant sets and of propelling sets provided with an insulating envelope. 4,389,264, Cl. 149-14.000.

Klotz, Helmut: *See*—
Dinger, Hans; and Klotz, Helmut, 4,388,802, Cl. 60-606.000.

KMMCO Structural Foam, Inc.: *See*—
Hendry, James W., 4,389,358, Cl. 264-45.100.

Knibiehler, Ernst; and Hirmann, Georg, to Mobil Oil Corporation. Programmable indicator system. 4,389,709, Cl. 364-551.000.

Kniepkamp, Hermann: *See*—
Mueller, Jan-Erik; Ristow, Dietrich; and Kniepkamp, Hermann, 4,389,280, Cl. 156-645.000.

Knott, Jack E., II: *See*—
Schaefer, Suzanne E.; and Knott, Jack E., II, 4,389,450, Cl. 428-212.000.

Knudsen, Hans B.: *See*—
Houd, Rolf D.; and Knudsen, Hans B., 4,389,252, Cl. 106-100.000.

Kobayashi, Ikuro; and Shimizu, Kyozo, to VLSI Technology Research Association. Method for measuring surface temperature distribution and system. 4,389,125, Cl. 374-164.000.

Kobayashi, Masaaki: *See*—
Isaka, Takenobu; and Kobayashi, Masaaki, 4,389,686, Cl. 360-77.000.

Kobayashi, Takehiro: *See*—
Sazaki, Kounin; and Kobayashi, Takehiro, 4,389,027, Cl. 242-84.20G.

Kober, Hans-Rudolf: *See*—
Ernst, Alfons; and Kober, Hans-Rudolf, 4,388,758, Cl. 33-1.0PT.

Koburger, Charles W., III: *See*—
Geipel, Henry J., Jr.; Hsieh, Ning; Koburger, Charles W., III; and Nesbit, Larry A., 4,389,257, Cl. 148-1.500.

Kocks Technik GmbH & Company: *See*—
Moltner, Hermann, 4,388,819, Cl. 72-234.000.

Kodama, Hiroshi; Maeda, Tooru; and Miyatani, Toshio, to Toyo Kogyo Co. Ltd. Lubricating oil supply system for a supercharged rotary piston engine. 4,388,901, Cl. 123-213.000.

Kogawa, Kouichi; Kawasaki, Teruo; and Mimura, Akitoshi, to Nissan Motor Company, Limited. Windshield wiper system for an automotive vehicle. 4,389,603, Cl. 318-443.000.

Kogler, Peter, to Voest-Alpine Aktiengesellschaft. Device for preventing ingress of dust through the annular gap between the cutting arm and the cutting head of a cutting machine. 4,389,075, Cl. 299-81.000.

Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodiuk, Catherine, to Bell Telephone Laboratories, Incorporated. Photoelectrochemical processing of InP-type devices. 4,389,291, Cl. 204-129.300.

Kohle, Ulrich; and Paffhausen, Hans. Carbon film. 4,389,449, Cl. 428-203.000.

Koida, Yoshiyuki: *See*—
Samejima, Masayoshi; Hirata, Goichi; and Koida, Yoshiyuki, 4,389,331, Cl. 427-213.300.

Kojima, Sadao; Shimada, Masaaki; Sakai, Kunio; and Horie, Katuo. Apparatus for the preparation of slaked lime solution. 4,389,376, Cl. 422-228.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Furusawa, Kahei; Ejiri, Yoshihiro; Yamazaki, Yoshihiko; Matsuzaki, Tadayoshi; Nakashima, Hiroyuki; and Harada, Osamu, 4,389,086, Cl. 350-96.200.

Komarek, Karl R., to K. R. Komarek, Inc. Ram-type feeder for briquetting press. 4,389,178, Cl. 425-237.000.

Komiyama, Choji: *See*—
Oishi, Kengo; Suzuki, Osamu; and Komiyama, Choji, 4,389,690, Cl. 360-132.000.

Kona Corporation: *See*—
Devellian, Richard D.; and Swenson, Paul M., 4,389,002, Cl. 222-146.0HS.

Kondo, Hiroatsu; Ozawa, Toshiaki; and Miyakawa, Hideaki, to Canon Kabushiki Kaisha. Printer with electromagnetic drive yokes. 4,389,131, Cl. 400-157.200.

Kondo, Isao; and Nakamura, Hiroaki, to Olympus Optical Company Ltd. Photometry power supply for automatic electronic flash. 4,389,596, Cl. 315-151.000.

Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive composition sensitized by a thiobarbituric acid derivative. 4,389,477, Cl. 430-81.000.

Kondo, Toshikatsu: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Sakaida, Atsuo, 4,389,128, Cl. 400-124.000.

Konig, Gottfried: *See*—
Lenk, Michael; and Konig, Gottfried, 4,389,107, Cl. 354-25.000.

Konig, Werner; Wagenbach, Wolfgang; May, Hans; and Bleidt, Rolf, to Brown, Boveri & Cie AG. Rotary disconnect switch. 4,389,553, Cl. 200-148.00H.

Konishi, Tatsuo: *See*—
Mizukami, Mineo; and Konishi, Tatsuo, 4,389,678, Cl. 360-10.300.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fukushima, Syousuke, 4,389,098, Cl. 350-429.000.

Kono, Yuichiro: *See*—
Nakai, Tetsuo; Kono, Yuichiro; Yazu, Shuji; and Hara, Akio, 4,389,465, Cl. 428-698.000.

Konvalin, Laurence H. Heavy metals separator. 4,389,309, Cl. 209-465.000.
Kopecko, William L.; Fuller, Robert L.; and Duchac, Joseph O. Fixture for resurfacing vehicle brake discs. 4,388,846, Cl. 82-4.00A.
Koppers Company, Inc.: *See*—
Cain, George R., 4,389,284, Cl. 202-247.000.
Harju, Philip H.; and Pasek, Eugene A., 4,389,336, Cl. 252-440.000.
Korach, Malcolm, to PPG Industries, Inc. Permionic membrane electrolytic cell. 4,389,297, Cl. 204-252.000.
Korek, Johannes, to Kraftanlagen A.G. Apparatus for the continuous cooking of wort. 4,388,857, Cl. 99-276.000.
Korf Industrie und Handel GmbH und Co KG: *See*—
Weber, Ralph; and Wells, William, 4,389,043, Cl. 266-218.000.
Korn, Gerhard: *See*—
Girod, Hansjochen; and Korn, Gerhard, 4,388,872, Cl. 105-99.000.
Korpman, Ralf, to Johnson & Johnson. Novel alloy compositions and products. 4,389,444, Cl. 428-137.000.
Kosseim, Alexander J. M.: *See*—
Sokolik, Joseph E., Jr.; Kosseim, Alexander J. M.; and Atwood, Gilbert R., 4,389,383, Cl. 423-243.000.
Kovats, Tibor F. I.: *See*—
Devenyi, Tibor F.; Kovats, Tibor F. I.; and Look, Christopher M., 4,389,557, Cl. 219-85.0CM.
Kowa Company, Ltd.: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.
Koyanagi, Yukiaki: *See*—
Honma, Yoshikiyo; Shimogawara, Jun; Nagata, Museyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, 4,389,126, Cl. 400-82.000.
Kozikowski, Carrie L.: *See*—
McDuffee, Frederick T.; and Kozikowski, Carrie L., 4,389,428, Cl. 427-54.100.
Kracklauer, John J., to Syntex (U.S.A.) Inc. Method of conditioning diesel engines. 4,389,220, Cl. 44-57.000.
Kraemer, John F.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Varnum, Nancy C., 4,389,498, Cl. 523-139.000.
Kraftanlagen A.G.: *See*—
Korek, Johannes, 4,388,857, Cl. 99-276.000.
Krall & Roth, Weberei GmbH & Co., K.G.: *See*—
d'Alquen, Gunter, 4,388,801, Cl. 57-12.000.
Krallmann, Reinhold: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,389,216, Cl. 8-639.000.
Kramer, Gideon A., to Source Technology Corporation. Slide projector having two image-projection systems which operate with a single slide tray. 4,389,103, Cl. 353-25.000.
Krapfenbauer, Hans, to Ernst Grob, Firma. Method and apparatus for fabricating precision teeth. 4,388,818, Cl. 72-81.000.
Krautkramer-Branson, Inc.: *See*—
Kaule, Walter, 4,388,832, Cl. 73-655.000.
Krautz, Kurt; and Ender, Erhard, to Autoflug-Stakupress GmbH & Co. Buckle for a safety belt. 4,388,746, Cl. 24-230.00A.
Krone, Herbert. Process and an apparatus for testing the coagulation properties of liquids. 4,388,824, Cl. 73-64.100.
Kropp, Walter: *See*—
Richter, Rudolf; and Kropp, Walter, 4,388,946, Cl. 137-596.200.
Krumrein, Gerhard, to Licentia Patent-Verwaltungs-GmbH. Circuit for a flasher unit. 4,389,597, Cl. 315-200.00A.
Kruse, Hubert: *See*—
Schneider, Manfred; Kruse, Hubert; and Opitz, Konrad, 4,389,213, Cl. 8-524.000.
Kudriavetz, Peter, to Acushnet Company. Method and apparatus for stripping molded round articles from mold. 4,389,365, Cl. 264-297.800.
Kuenen, Cornelis A.: *See*—
Ferket, Florimond; and Kuenen, Cornelis A., 4,388,816, Cl. 72-11.000.
Kukkula, Juhani, to Valmet Oy. Linkage for moment balancing measuring apparatus. 4,388,943, Cl. 137-85.000.
Kumagai, Sakae: *See*—
Noro, Katsuhiko; Nagaki, Yusei; Sasaki, Shinpei; and Kumagai, Sakae, 4,389,360, Cl. 264-71.000.
Kumazawa, Toshihiko: *See*—
Mitsuhata, Masashi; Nagase, Shin-ichi; Nakai, Takahiko; and Kumazawa, Toshihiko, 4,389,338, Cl. 252-463.000.
Kumor, Bernd: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.
Kunieda, Takafumi: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.
Kunne, Wolfgang, to Stielow GmbH. Apparatus for emptying envelopes. 4,388,793, Cl. 53-381.00R.
Kuraray Company, Limited: *See*—
Miyazaki, Hirotoshi, 4,389,513, Cl. 525-186.000.
Mori, Fumio; Shiono, Manzo; and Omura, Yoshiaki, 4,389,412, Cl. 424-305.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,389,387, Cl. 423-447.700.
Yoshida, Masafumi; and Nakamura, Kenichi, 4,389,445, Cl. 428-77.000.
Kurihara, Toshiro, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Air-fuel ratio control system. 4,388,905, Cl. 123-440.000.
Kurnit, Norman A., to United States of America, Energy. Combination ring cavity and backward Raman waveguide amplifier. 4,389,617, Cl. 330-4.300.
Kuroda, Hiroshi: *See*—
Sanahara, Yasumasa; and Kuroda, Hiroshi, 4,389,732, Cl. 455-160.000.
Kurokawa, Hiromichi, to Sony Corporation. Color television camera system. 4,389,666, Cl. 358-47.000.
Kurosaki, Shiro; and Watanabe, Minoru, to Sumitomo Electric Industries, Ltd. Process for the production of an optical glass article. 4,389,233, Cl. 65-31.000.
Kurz, Manfred: *See*—
Saur, Roland; and Kurz, Manfred, 4,389,629, Cl. 337-126.000.
Kuwayama, Hideki, to Kabushiki Kaisha Hokushin Denki Seisakusho. Differential pressure gauge. 4,388,833, Cl. 73-718.000.
Kyojima, Yoshiyuki: *See*—
Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, 4,389,268, Cl. 156-150.000.
La Freniere, Henry. Portable water purifier. 4,389,311, Cl. 210-198.100.
Lalin, Hill S. Portable holder assembly for gas detection tube. 4,389,372, Cl. 422-88.000.
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Levine, Herbert R.; and Landry, L. Gerard, 4,389,587, Cl. 310-208.000.
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Laurent, Jean; Monnet, Bernard; and Pertuis, Philippe, to Pont-A-Mousson S.A. External frame injection molding apparatus. 4,389,183, Cl. 425-589.000.
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Godley, Fred O.; and Laurents, John A., 4,389,000, Cl. 221-8.000.
Laverriere, Stanislas G. L., to S.A. Joulin Sema. Gripping device operating by suction. 4,389,064, Cl. 294-64.00R.
Lavery, John J., to Champion International Corporation. Multiple access carton. 4,388,993, Cl. 206-611.000.
Lawler, Michael S. Pick-proof lock. 4,388,815, Cl. 70-134.000.
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Farino, Frank G., 4,388,931, Cl. 128-425.000.
Lechaton, John S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Lechaton, John S.; and Walsh, James L., 4,389,281, Cl. 156-646.000.
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Wynne, Peter J., 4,389,042, Cl. 266-210.000.
Lee, Earl J.: *See*—
Kite, William C., 4,389,173, Cl. 418-146.000.
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Nadin, Robert P.; and Lee, Jannan G., 4,389,143, Cl. 406-197.000.
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Hitt, James J.; and Kern, Scott L., 4,389,674, Cl. 358-213.000.
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Lelandais, Guy, to Enertec. Switch-tuned filters. 4,389,683, Cl. 360-65.000.
Lenaghan, Arlene R. Catamenial bandage. 4,389,211, Cl. 604-383.000.
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Lenke, Dieter: *See*—
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Ionescu, Marian I.; Lenker, Jay A.; Rosenbluth, Robert F.; and Seiler, Louis, Jr., 4,388,735, Cl. 3-1.500.

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Leopold, Phillip M.: *See*—
Cooper, Adrianus A. G.; and Leopold, Phillip M., 4,389,269, Cl. 156-172.000.

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Trezequet, Jean-Pierre, 4,389,088, Cl. 350-96.230.
Vives, Jean-Patrick, 4,388,799, Cl. 57-6.000.

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Bendayan, Jacques; and Jocteur, Robert, 4,389,087, Cl. 350-96.230.

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Scrutton, Simon L.; Marwick, William F. G.; and Wilson, David R., 4,389,473, Cl. 430-17.000.

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LeVeen, Robert F.; and LeVeen, Eric G., 4,389,208, Cl. 604-95.000.

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Reissmann, Hermann A. W.; and Milo, Bernd T., 4,389,426, Cl. 426-602.000.

Levine, Herbert R.; and Landry, L. Gerard, to United Technologies Corporation. Unitary sleeving insulation. 4,389,587, Cl. 310-208.000.

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Tice, Thomas R.; and Lewis, Danny H., 4,389,330, Cl. 427-213.360.

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Wagner, Theodore W.; Liang, Sam; and Muzumdar, Deepak R., 4,389,544, Cl. 179-2.0DP.

Licentia Patent-Verwaltungs-GmbH: *See*—
Baumer, Hans, 4,388,867, Cl. 102-211.000.
Hofmeister, Hagen, 4,389,722, Cl. 370-100.000.
Krumrein, Gerhard, 4,389,597, Cl. 315-200.00A.
Rettich, Renate; and Schwedes, Wilhelm, 4,389,430, Cl. 427-230.000.

Lidholt, Rune; and Nodfelt, Ingvar. Method and device for connecting optical fibers. 4,389,091, Cl. 350-96.200.

Lieberman, Robert: *See*—
Epstein, Daniel; and Lieberman, Robert, 4,389,669, Cl. 358-101.000.

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Focke, Heinz H.; and Liedtke, Kurt W., 4,388,794, Cl. 53-389.000.

Lim, Franklin; and Moss, Richard D., to Damon Corporation. Vitamin encapsulation. 4,389,419, Cl. 426-72.000.

Limberg, Allen L., to RCA Corporation. Adjustable-gain current amplifier for temperature-independent trimming. 4,389,619, Cl. 330-288.000.

Lincoln Manufacturing Co., Inc.: *See*—
Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,388,743, Cl. 16-116.00A.

Linde Aktiengesellschaft: *See*—
Richter, Rudolf; and Kropp, Walter, 4,388,946, Cl. 137-596.200.

Lindenmaier, Klaus, to Daimler-Benz Aktiengesellschaft. Apparatus for producing a defined fuel vapor-air mixture for gasoline internal combustion engines. 4,388,911, Cl. 123-557.000.

Lindenmuth, William T.: *See*—
Johnson, Virgil E., Jr.; and Lindenmuth, William T., 4,389,071, Cl. 299-14.000.

Linder, Ernst; Muller, Klaus; and Maurer, Helmut, to Robert Bosch GmbH. Heated ion current sensor for high temperatures. 4,389,373, Cl. 422-98.000.

Lindner, Georg H., to M&T Chemicals Inc. Glass coating hood and method of spray coating glassware. 4,389,234, Cl. 65-60.100.

Lingaraju, Bhartoor, to Square D Company. Strain relief clamp. 4,389,082, Cl. 339-103.00R.

Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, to Gewerkschaft Eisenhutte Westfalia. Longwall mineral mining installation. 4,389,072, Cl. 299-32.000.

Litton Industrial Products, Inc.: *See*—
Cutter, James, 4,389,730, Cl. 378-153.000.

Livemore, Gerald S. V. Gas producers apparatus. 4,389,222, Cl. 48-76.000.

Lo, Pak-Kan A.; and Williams, James B., to Merck & Co., Inc. Solubilization of ivermectin in water. 4,389,397, Cl. 424-180.000.

Locke, Timothy L.: *See*—
Hermann, Carl Z.; and Locke, Timothy L., 4,388,777, Cl. 46-79.000.

Lockwood Technical, Inc.: *See*—
Franklin, Jerry C., 4,389,001, Cl. 222-63.000.

Logie, Charles F., to American Store Equipment Corporation. Prefabricated partition arrangement. 4,388,783, Cl. 52-36.000.

Longenecker, Bruce A. Device for monitoring selected operating conditions of combustion within a solid fossil fuel burning furnace. 4,389,124, Cl. 374-147.000.

Lonsinger, Jack J.; and Halbleib, Chester W., to Mobay Chemical Corporation. Preparation of O,S-dialkyl phosphoroamidothioates. 4,389,350, Cl. 260-989.000.

Look, Christopher M.: *See*—
Devenyi, Tibor F.; Kovats, Tibor F. I.; and Look, Christopher M., 4,389,557, Cl. 219-85.0CM.

Lorenz, Horst, to Th. Kieserling & Albrecht, GmbH & Co. KG. Apparatus for bundling elongated workpieces. 4,389,148, Cl. 414-85.000.

Lovibond, Michael J., to Xerox Corporation. Stitching machine. 4,389,011, Cl. 227-5.000.

Lowe, Richard L. Apparatus for moving a vessel heater cover. 4,389,191, Cl. 432-250.000.

Lowery, Jack R., Sr.: *See*—
Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., 4,388,879, Cl. 112-10.000.

Lucas Industries Limited: *See*—
Farr, Glyn P. R., 4,389,167, Cl. 417-289.000.
Woodhouse, John L., 4,389,471, Cl. 429-178.000.

Lucas, Robert M.: *See*—
Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., 4,388,964, Cl. 165-32.000.

Lude, John: *See*—
Holowaty, Michael O.; Hughes, Ian F.; and Lude, John, 4,389,249, Cl. 75-129.000.

Luke, John A., to British-American Tobacco Company Limited. Filters. 4,388,934, Cl. 131-339.000.

Lukyanchenko, Leonid F.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Luscombe, Anthony P.; and Brooks, Seville R., to Marconi Company Limited, The. Doppler radar system. 4,389,648, Cl. 343-8.000.

Luttrell, Ronald: *See*—
Larson, Wally M., 4,388,898, Cl. 123-90.380.

M. H. Detrick Co., Ltd.: *See*—
Harvey, Barrie J.; and Willson, Robert C., 4,389,189, Cl. 432-247.000.

M&T Chemicals Inc.: *See*—
Lindner, Georg H., 4,389,234, Cl. 65-60.100.

MacArthur, J. Ward: *See*—
Anderson, Paul A.; Hammer, Jeffrey M.; and MacArthur, J. Ward, 4,389,577, Cl. 307-39.000.

MacDonald, J. G. Fraser, to Warner Electric Brake & Clutch Company. Anti-kickback clutch-brake unit. 4,388,988, Cl. 192-12.0BA.

Machikin, Viktor I.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

MacMillan Bloedel Limited: *See*—
Schilling, Walter W., 4,388,957, Cl. 144-366.000.

Madsen, Tonni B., to Danske Andelsslagteriers Kodfoder-og Albuminfabrik. Process for the production of powdered protein materials from animal raw material. 4,389,423, Cl. 426-417.000.

Maeda, Tooru: *See*—
Kodama, Hiroshi; Maeda, Tooru; and Miyatani, Toshio, 4,388,901, Cl. 123-213.000.

Maes, Michel E., to Detonics Pistol Accessories, Ltd. Adjustable sight for firearms. 4,388,772, Cl. 42-1.00S.

Magnussen, Haakon T., Jr.; and Ruskewicz, Stephen J., to Altex Scientific, Inc. Pressure booster system for fluids. 4,389,163, Cl. 417-2.000.

Magosch, Karl-Heinz: *See*—
Moller, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, 4,389,226, Cl. 55-208.000.

Mainusch, Rudolf: *See*—
Linke, Horst; Erwien, Helmut; Beyer, Herbert; Kerklies, Bodo; Wleklinski, Bernhard; Mainusch, Rudolf; Grundken, Dieter; Kumor, Bernd; and Mohn, Ulrich, 4,389,072, Cl. 299-32.000.

Maki, Naoki: *See*—
Yamaguchi, Kiyoshi; Maki, Naoki; and Tamura, Toshio, 4,389,585, Cl. 310-52.000.

Makino, Shinichi: *See*—
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Malherbe, Roger F., to Ciba-Geigy Corporation. 2,3-Dihydroperimidines as antioxidants for lubricants. 4,389,321, Cl. 252-47.000.

Malinowsky, Marc: *See*—
Queffelec, Corentin; Bordet, Rene; and Malinowsky, Marc, 4,388,785, Cl. 52-222.000.

Man Maschinenf Abrik Augsburn-Nurnberg: *See*—
Muhlratzer, August, 4,389,464, Cl. 428-667.000.
Mani, Krishnamurthy N.; and Chlanda, Frederick P., to Allied Corporation. Process for the recovery of anhydrous hydrogen fluoride from aqueous solutions of fluosilicic acid and hydrogen fluoride. 4,389,293, Cl. 204-180.00P.
Mannhart, Peter; and Ruppen, Bruno, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Weapon simulator. 4,388,826, Cl. 73-167.000.
Manor, Sissy J. Identification badge. 4,388,770, Cl. 40-1.600.
Mansour, Maher L.: *See*—
Chu, Richard S.; and Mansour, Maher L., 4,389,357, Cl. 264-40.100.
Mantel, Joseph: *See*—
Weissman, Howard R.; and Mantel, Joseph, 4,388,924, Cl. 128-303.100.
Manzoni, Stephane. Control device for controlling an outside rearview mirror from inside a vehicle. 4,388,840, Cl. 74-501.00M.
Marcell, Gerald V., to Kawasaki Motors Corp. Locking device for a differential mechanism. 4,388,842, Cl. 74-710.500.
Marchon, Bruno: *See*—
Rouillard epouse Bauer, Denise; Cote, Gerard; Fossi, Paolo; and Marchon, Bruno, 4,389,379, Cl. 423-89.000.
Marconi Company Limited, The: *See*—
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Mares, Frank: *See*—
Diamond, Steven E.; Mares, Frank; and Szalkiewicz, Andrew, 4,389,348, Cl. 260-465.50R.
Margaroli, John L.; and Cimperman, Frederick J., to Vistan Corporation. Machine for pitting and stuffing olives. 4,388,858, Cl. 99-494.000.
Marine Structure Consultants (MSC) BV: *See*—
Bordes, Cornelis, 4,389,140, Cl. 405-195.000.
Marshall, Gailen; Myska, C. H.; and Smith, Kenneth E., to NL Industries, Inc. Borehole pipe side entry method and apparatus. 4,388,969, Cl. 166-242.000.
Marshall, Robert M., to Allied Corporation. Stabilized finish composition. 4,389,456, Cl. 428-375.000.
Martinez, Pasquale; and Di Nunzio, Vittorio, to Fiat Auto S.p.A. Apparatus for calibrating the carbon monoxide emission under idling conditions of an internal combustion engine provided with a Bosch L-Jetronic electronic injection apparatus. 4,388,821, Cl. 73-1.00R.
Martinon, Gerard R.; Dayme, Jean-Louis; and Martinon, Roger J. Washing bag for curtains, drapes and the like. 4,388,739, Cl. 8-150.000.
Martinon, Roger J.: *See*—
Martinon, Gerard R.; Dayme, Jean-Louis; and Martinon, Roger J., 4,388,739, Cl. 8-150.000.
Marukawa, Katsukiyo: *See*—
Okamura, Shozo; Nakajima, Hidemasa; Marukawa, Katsukiyo; Anezaki, Shoji; and Hirata, Takeyuki, 4,389,246, Cl. 75-60.000.
Maruyama, Takashi, to Chinon Kabushiki Kaisha. Focusing control device. 4,389,106, Cl. 354-25.000.
Marwick, William F. G.: *See*—
Scrutton, Simon L.; Marwick, William F. G.; and Wilson, David R., 4,389,473, Cl. 430-17.000.
Marx, Matthias: *See*—
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Masaki, Kenji, to Nissan Motor Company, Limited. Air-fuel ratio control system. 4,388,904, Cl. 123-440.000.
Maschinenfabrik Hennecke GmbH: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferdinand, 4,389,375, Cl. 422-111.000.
Masclet, Jean; and Veaux, Jacques, to Messier-Hispano-Bugatti. Device for the detection of the displacement of at least one point relative to a referential, and application of the detection of the underinflated state of tires and/or of mass and centering for aerodynes. 4,388,763, Cl. 33-203.180.
Massey-Ferguson Services N.V.: *See*—
Brown, David J., 4,389,151, Cl. 414-685.000.
Massingill, John L., Jr.: *See*—
Friedli, Hans R.; Nelson, Donald L.; and Massingill, John L., Jr., 4,389,512, Cl. 525-112.000.
Masu, Masanobu: *See*—
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Masuda, Jun: *See*—
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Matheny, William F., III: *See*—
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Matsubayashi, Hajime: *See*—
Fujioka, Hironari; and Matsubayashi, Hajime, 4,389,451, Cl. 428-212.000.
Matsui, Toshihiko: *See*—
Okajima, Kunihiko; Kamide, Kenji; and Matsui, Toshihiko, 4,389,523, Cl. 536-59.000.
Matsumiya, Toshiharu: *See*—
Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.
Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, to Ricoh Company, Ltd. Improved developing device for two-color electrophotographic copying apparatus. 4,389,113, Cl. 355-3.0DD.
Matsuo, Kenji: *See*—
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Matsuo, Masayuki: *See*—
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Matsushita Electric Corp. of America: *See*—
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Matsushita Electric Industrial Company, Limited: *See*—
Aihara, Yukichi; and Yamashita, Sadahiko, 4,389,624, Cl. 333-226.000.
Hamane, Takuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,388,952, Cl. 140-92.100.
Hori, Yoshikazu; Asai, Komei; and Fukai, Masakazu, 4,389,096, Cl. 350-339.00R.
Isaka, Takenobu; and Kobayashi, Masaaki, 4,389,686, Cl. 360-77.000.
Uno, Yoshihiro, 4,389,591, Cl. 313-391.000.
Watanabe, Taisuke; Niyada, Katsuyuki; Hiraoka, Shoji; and Kaga, Kenji, 4,389,539, Cl. 179-1.0SM.
Matsushita Electric Works, Ltd.: *See*—
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Takeyama, Hidetoshi; Sakamoto, Siro; Sagawa, Koji; Tanishi, Tokio; Aiboshi, Hiroaki; and Morimoto, Takao, 4,388,757, Cl. 29-882.000.
Matsuzaki, Tadayoshi: *See*—
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Matthews, Hugh B., to Sperry Corporation. Geothermal power extraction system with above surface heating of working fluid. 4,388,807, Cl. 60-641.400.
Matunaga, Masatugu: *See*—
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, 4,389,516, Cl. 525-534.000.
Mau, Hartmut: *See*—
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Mauer, John L., IV: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Mauer, John L., IV; and Sarkary, Homi G., 4,389,294, Cl. 204-192.00E.
Maurer, Helmut: *See*—
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Maurer, Herman J.: *See*—
Pedersen, Carl O.; and Maurer, Herman J., 4,389,153, Cl. 414-695.500.
Maxwell, Dorothy; and Fell, David A., to American Can Company. Opaque jet ink compositions. 4,389,503, Cl. 524-38.000.
Maxwell, Jerrold F.: *See*—
Wilson, Joe C.; Eisenstein, Stephen E.; Maxwell, Jerrold F.; and Hirozawa, Stanley T., 4,389,371, Cl. 422-15.000.
May, Hans: *See*—
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May, Hans-Joachim; Lenke, Dieter; Gries, Josef; Teschendorf, Hans-Juergen; and Worstmann, Wolfgang, to BASF Aktiengesellschaft. 1-Aroyl-2-phenylamino-2-imidazolines, drugs containing these compounds, and use thereof. 4,389,403, Cl. 424-258.000.
Mayer, Fritz: *See*—
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,389,214, Cl. 8-527.000.
Mayery Richard T.: *See*—
DeLoach, John R.; Harris, Robert L.; Mayery Richard T.; and Ihler, Garret M., 4,389,209, Cl. 604-53.000.
McClintock, Jack M., to Morgan Adhesives Company. Method for application of composite pressure sensitive adhesive. 4,389,270, Cl. 156-218.000.
McCord Corporation: *See*—
Colby, Daniel E., 4,389,177, Cl. 425-144.000.
McCorriston, Lois L., to Gulf Canada Limited. Process using sulphate reagent for recovering vanadium from cokes derived from heavy oils. 4,389,378, Cl. 423-68.000.
McCoy, Ewald H., to Electrochemical Products, Inc. Alkaline plating baths and electroplating process. 4,389,286, Cl. 204-44.000.
McCray, Joseph A.: *See*—
Fanuele, Michael A.; McCray, Joseph A.; and Rittenbach, Otto F., 4,389,647, Cl. 343-7.700.
McCulloch, Andrew J.: *See*—
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McDuffee, Frederick T.; and Kozikowski, Carrie L., to International Telephone and Telegraph Corporation. Method of rejacketing a fusion splice in an ultraviolet light curable resin jacketed optical fiber. 4,389,428, Cl. 427-54.100.
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Garnaud, Guy; and Bouhier, Roger, 4,388,823, Cl. 73-57.000.
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Chow, Ho, 4,389,014, Cl. 236-1.00G.
Melton, Keith; Mercier, Olivier; and Riegger, Helmut, to BBC Brown, Boveri & Company Limited. Memory alloys based on copper or nickel solid solution alloys having oxide inclusions. 4,389,250, Cl. 75-232.000.
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Hoesslin, Gerhard V.; and Hesse, Jurgen, 4,389,366, Cl. 264-558.000.
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Winterling, Gerhard, 4,389,534, Cl. 136-256.000.
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Simo, Thomas; and Eisenlohr, Karl-Heinz, 4,389,303, Cl. 208-107.000.
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Petretti, Anthony V., 4,389,314, Cl. 210-241.000.
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Nicholls, Bryan F., 4,389,469, Cl. 429-98.000.
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Mitchell, Wilbur A. E. Lasers. 4,389,560, Cl. 219-121.00L.
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Kajiyama, Ryuichi; and Iwata, Shigemi, 4,389,631, Cl. 340-21.000.
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Mobay Chemical Corporation: *See*—
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Cumings, Norman E., 4,389,141, Cl. 405-211.000.

Godbey, John K.; and Ballard, Billy G., 4,389,164, Cl. 417-36.000.
Horodysky, Andrew G., 4,389,322, Cl. 252-49.600.
Hungerford, Gordon P., 4,389,437, Cl. 428-35.000.
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Knibiehler, Ernst; and Hirmann, Georg, 4,389,709, Cl. 364-551.000.
Weiner, Milton L., 4,389,436, Cl. 428-35.000.
Mobius, Olaf, to Degussa AG. Stiffening and non-slip material for the heel region of shoes. 4,388,768, Cl. 36-68.000.
Mochizuki, Hiroshi: *See*—
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Mod-Sod Sports Surfaces, Inc.: *See*—
Haas, Frederick T., Jr., 4,389,435, Cl. 428-17.000.
Modone, Eros; and Roba, Giacomo, to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A. Process for improving the transmission characteristics of optical fibers drawn from preforms made by the MCVD technique. 4,389,230, Cl. 65-3.120.
Mohn, Ulrich: *See*—
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Moller, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, to Chemische Werke Huls Aktiengesellschaft. Open heated box trays having flow-promoting devices. 4,389,226, Cl. 55-208.000.
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Moltner, Hermann, to Kocks Technik GmbH & Company. Rolling mills. 4,388,819, Cl. 72-234.000.
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Eng, Clifford D.; Gambell, James W.; and Yuen, Henry K., 4,389,325, Cl. 252-186.350.
Morel, Gilbert; Frappart, Pierre; and Saint Marcoux, Roland, to Thomson-CSF. Integrated voltage multiplier. 4,389,703, Cl. 363-61.000.
Moret, Claude M. Machine for the chemical frosting of glass articles. 4,388,937, Cl. 134-73.000.
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Mori, Kazuyuki: *See*—
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Mori, Kei. Lighting system utilizing the sunlight. 4,389,085, Cl. 350-96.100.
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Mueller, Jan-Erik; Ristow, Dietrich; and Kniepkamp, Hermann, to Siemens Aktiengesellschaft. Method of manufacturing very thin semiconductor chips. 4,389,280, Cl. 156-645.000.
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Murdock, Keith C., to American Cyanamid Company. Thiocarbamoyl heterocycle-anthraquinone derivatives. 4,389,399, Cl. 424-248.500.
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Nadin, Robert P.; and Lee, Jannan G., to Union Carbide Corporation. Method of unplugging dense conveying system. 4,389,143, Cl. 406-197.000.
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Nagao, Nobuya; and Sakai, Teturou, to Tokyo Shibaura Denki Kabushiki Kaisha. Color demodulation device for use in color television receivers. 4,389,665, Cl. 358-23.000.
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Nagata, Hiromichi, to Citizen Watch Co., Ltd. Structure for securing a band to a watchcase. 4,389,006, Cl. 224-164.000.
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Nakamura, Kenichi: *See*—
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Nakamura, Makoto; and Sugiyama, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Adaptive linear prediction filters. 4,389,540, Cl. 179-1.50A.

Nakamura, Tsutomu: *See*—
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Nakamura, Yoshikathu, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Electric Co., Ltd. Character reading apparatus. 4,389,634, Cl. 382-11.000.

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Nakashima, Hiroyuki: *See*—
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Wada, Makoto; Iwasaki, Koichi; and Nakata, Hajime, 4,388,960, Cl. 152-209.00R.

Nakatomi, Takayoshi: *See*—
Sugiyama, Shinichi; and Nakatomi, Takayoshi, 4,388,906, Cl. 123-492.000.

Nakayama, Masahoto: *See*—
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kunieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.

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Seyffert, Michael; and Taatjes, Steven W., 4,389,296, Cl. 204-206.000.

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Rushby, Robert J.; and Parmar, Yashvant S., 4,389,677, Cl. 358-280.000.

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Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Nelson, Donald L.: *See*—
Friedli, Hans R.; Nelson, Donald L.; and Massingill, John L., Jr., 4,389,512, Cl. 525-112.000.

Nelson, Roland D.: *See*—
Floyd, Thomas D.; Nelson, Roland D.; and Bonagura, Ronald L., 4,389,117, Cl. 355-87.000.

Nemier, Stanley E.: *See*—
Boyanowski, Robert E.; Gregory, Floyd A.; and Nemier, Stanley E., 4,389,008, Cl. 226-123.000.

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Carleton, John V.; and Nenadic, Nick, 4,388,873, Cl. 105-377.000.

Nenci, Claudio. Machine for the production of tubular casings of alimentary dough. 4,389,176, Cl. 425-101.000.

Nesbit, Larry A.: *See*—
Geipel, Henry J., Jr.; Hsieh, Ning; Koburger, Charles W., III; and Nesbit, Larry A., 4,389,257, Cl. 148-1.500.

Netravali, Arun N.: *See*—
Bowen, Edward G.; and Netravali, Arun N., 4,389,672, Cl. 358-160.000.

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Neumann, Peter: *See*—
Hoffmann, Gerhard; and Neumann, Peter, 4,389,475, Cl. 430-58.000.

Neumann-Spallart, Michael: *See*—
Gratzel, Michael; and Neumann-Spallart, Michael, 4,389,290, Cl. 204-128.000.

Neuwirth, Siegmund A. Dental reducing tool. 4,389,192, Cl. 433-166.000.

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Roumiguieres, Jean-Louis A.; and Neviere, Michel J., 4,389,094, Cl. 350-162.170.

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Dowdy, Edward J.; Nicholson, Nicholas; and Caldwell, John T., 4,389,568, Cl. 250-362.000.

Nicolas, Denise: *See*—
Dawans, Francois; Devaud, Marguerite; and Nicolas, Denise, 4,389,460, Cl. 428-458.000.

Nicoletti, Alessandro: *See*—
De Dionigi, Manlio M., 4,389,169, Cl. 417-417.000.

Nigalaye, Ashok: *See*—
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., 4,389,393, Cl. 424-19.000.

Nigel, George G.: *See*—
Badzinski, Richard D.; and Nigel, George G., 4,389,199, Cl. 440-74.000.

Nigon, Richard T.: *See*—
Baitis, A. Erich; Woolaver, Dennis A.; and Nigon, Richard T., 4,388,889, Cl. 114-144.00E.

Nigorikawa, Atsushi; Yokoyama, Hiroshi; and Fujieda, Takanori, to Nippon Electric Co., Ltd.; and Ando Electric Co., Ltd. High-speed pattern generator. 4,389,723, Cl. 371-27.000.

Niles, Paul D.: *See*—
Normann, Richard W.; and Niles, Paul D., 4,389,083, Cl. 339-105.000.

Nippon Electric Co., Ltd.: *See*—
Furusawa, Kahei; Ejiri, Yoshihiro; Yamazaki, Yoshihiko; Matsuzaki, Tadayoshi; Nakashima, Hiroyuki; and Harada, Osamu, 4,389,086, Cl. 350-96.200.
Futatsuishi, Godo, 4,389,621, Cl. 331-1.00A.
Honma, Yoshikiyo; Shimogawara, Jun; Nagata, Muneyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, 4,389,126, Cl. 400-82.000.
Mizukami, Mineo; and Konishi, Tatsuo, 4,389,678, Cl. 360-10.300.
Nakao, Masumi, 4,389,714, Cl. 365-189.000.
Nigorikawa, Atsushi; Yokoyama, Hiroshi; and Fujieda, Takanori, 4,389,723, Cl. 371-27.000.
Suda, Kazuyoshi; Fujimura, Akira; and Tsuda, Kiyoshi, 4,388,994, Cl. 209-564.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Sasahara, Yasumasa; and Kuroda, Hiroshi, 4,389,732, Cl. 455-160.000.

Nippon Hoso Kyokai: *See*—
Onishi, Shunichi; Obara, Masaharu; Sakurai, Masaru; Murakami, Junzo; and Makino, Shinichi, 4,389,623, Cl. 333-16.000.

Nippon Kogaku K.K.: *See*—
Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Motoori, Ryuzo, 4,389,108, Cl. 354-50.000.

Nippon Mining Co., Ltd.: *See*—
Iyama, Yukio; Fujita, Masao; and Higashiiriki, Nobuhiro, 4,389,044, Cl. 266-271.000.

Nippon Skokubai Kagaku Kogyo Co., Ltd.: *See*—
Mitsuhata, Masashi; Nagase, Shin-ichi; Nakai, Takahiko; and Kumazawa, Toshihiko, 4,389,338, Cl. 252-463.000.

Nippon Soken, Inc.: *See*—
Nakano, Osamu; and Sowa, Kunihiro, 4,389,541, Cl. 179-1.0SM.

Nippon Steel Corporation: *See*—
Noro, Katsuhiko; Nagaki, Yusei; Sasaki, Shinpei; and Kumagai, Sakae, 4,389,360, Cl. 264-71.000.

Nippon Telecommunication Engineering Company: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Sakaida, Atsuo, 4,389,128, Cl. 400-124.000.

Nippondenso Co., Ltd.: *See*—
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, 4,388,903, Cl. 123-440.000.

Nishimura, Shigeoki; Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, to Hitachi, Ltd. Process for removing crud from ion exchange resin. 4,389,253, Cl. 134-1.000.

Nishiwaki, Susumu: *See*—
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Nishizawa, Jun-ichi; and Ito, Kazuomi, to Nishizawa, Jun-ichi. Method of manufacturing pn junction in group II-VI compound semiconductor. 4,389,256, Cl. 148-1.500.

Nissan Motor Company, Limited: *See*—
Furuya, Katuji; and Yago, Tokuzo, 4,388,803, Cl. 60-284.000.
Hayashi, Kazuo, 4,389,170, Cl. 418-15.000.
Kimura, Yoshiyuki; Shiobara, Masaji; and Yoshiba, Yasutaka, 4,388,912, Cl. 123-569.000.
Kishi, Norimasa; and Yamamuro, Shigeaki, 4,388,845, Cl. 74-862.000.
Kogawa, Kouichi; Kawasaki, Teruo; and Mimura, Akitoshi, 4,389,603, Cl. 318-443.000.
Kurihara, Toshiro, 4,388,905, Cl. 123-440.000.
Masaki, Kenji, 4,388,904, Cl. 123-440.000.
Nakanishi, Keiichi, 4,389,158, Cl. 415-148.000.
Ogasawara, Hiroshi; and Takai, Miyao, 4,388,909, Cl. 123-501.000.
Shimada, Kiyoshi; and Ogawa, Naoki, 4,388,899, Cl. 123-198.00E.
Sugo, Yuko; and Yamamoto, Tadahiro, 4,388,907, Cl. 123-494.000.

Tsunoda, Masakazu; and Mori, Kazuyuki, 4,389,537, Cl. 179-1.05M.
Nisshin Oil Mills, Limited, The: *See—*
Yamada, Osamu; Higaki, Yuzo; and Ukai, Akitoshi, 4,389,346, Cl. 260-410.700.
Niyada, Katsuyuki: *See—*
Watanabe, Taisuke; Niyada, Katsuyuki; Hiraoka, Shoji; and Kaga, Kenji, 4,389,539, Cl. 179-1.05M.
NL Industries, Inc.: *See—*
Marshall, Gailen; Myska, C. H.; and Smith, Kenneth E., 4,388,969, Cl. 166-242.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Pulse motor driving apparatus. 4,389,605, Cl. 318-696.000.
Nodfelt, Ingvar: *See—*
Lidholt, Rune; and Nodfelt, Ingvar, 4,389,091, Cl. 350-96.200.
Nomaguchi, Hirotsugu: *See—*
Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, 4,389,477, Cl. 430-81.000.
Norman, Robert M. Oscillating jet head underwater trenching apparatus. 4,389,139, Cl. 405-163.000.
Normann, Richard W.; and Niles, Paul D., to Bendix Corporation, The. Electrical connector assembly. 4,389,083, Cl. 339-105.000.
Normier, Gerard: *See—*
Dussourd D'Hinterland, Lucien; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,389,396, Cl. 424-92.000.
Noro, Katsuhiko; Nagaki, Yusei; Sasaki, Shinpei; and Kumagai, Sakae, to Nippon Steel Corporation; and Yoshikawa Kogyo Co., Ltd. Method of forming a protective coating on a long lance to be immersed in molten metal. 4,389,360, Cl. 264-71.000.
Norris, Peter C.: *See—*
Kimber, Edward G.; and Norris, Peter C., 4,388,742, Cl. 15-250.420.
Northern Telecom Limited: *See—*
Devenyi, Tibor F.; Kovats, Tibor F. I.; and Look, Christopher M., 4,389,557, Cl. 219-85.0CM.
Northern Telecom Systems Corporation: *See—*
Sims, Dewey M., Jr., 4,389,689, Cl. 360-109.000.
Nosthinski, Rudiger: *See—*
Schmitt, Armin; and Nosthinski, Rudiger, 4,389,427, Cl. 426-631.000.
Novamet, Inc.: *See—*
Erich, Donald L.; Varall, Alfred J., Jr.; and Donachie, Stephen J., 4,389,240, Cl. 75-0.50B.
Schelleng, Robert D., 4,389,241, Cl. 75-0.50R.
Nozawa, Tetuo; Nagata, Jun; and Kakimoto, Michiyuki, to Daiwa Can Company, Limited. Method for electric resistance seam welding of the side overlapped portion of a tubular form. 4,389,556, Cl. 219-64.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Automatic focus controlling device. 4,389,565, Cl. 250-201.000.
Nuodex, Inc.: *See—*
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,389,328, Cl. 252-194.000.
Nuovo Pignone S.p.A.: *See—*
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,388,752, Cl. 29-421.00R.
N.V. APR Europe S.A.: *See—*
Vogel, Bruno, 4,389,116, Cl. 355-85.000.
Obara, Masaharu: *See—*
Onishi, Shunichi; Obara, Masaharu; Sakurai, Masaru; Murakami, Junzo; and Makino, Shinichi, 4,389,623, Cl. 333-16.000.
Oberst, Steven M., to Acorn Corrugated Box Co. Plastic connectors for corrugated material. 4,389,133, Cl. 403-230.000.
O'Brien, Herbert J. Water ski binding. 4,389,200, Cl. 441-70.000.
O'Brien, Sharon R., to Phillips Petroleum Company. Removal of solids from a cooling tower basin. 4,389,351, Cl. 261-36.00R.
Occidental Chemical Corporation: *See—*
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; Rothkegel, Josef; and Volling, Gudrun, 4,389,260, Cl. 148-6.15Z.
Occidental Research Corporation: *See—*
Hard, Robert A., 4,389,384, Cl. 423-304.000.
Oda, Takeshi: *See—*
Mori, Toshihito; Deushi, Takeo; Iwasaki, Akio; Kuvieda, Takafumi; Mizoguchi, Toshimi; Kamiya, Kazuhiro; Nakayama, Masahoto; Ito, Hisakatsu; and Oda, Takeshi, 4,389,486, Cl. 435-253.000.
Oelke, Erwin S., to Smith International, Inc. Two-stage pressure relief valve. 4,388,984, Cl. 184-54.000.
Oels, Udo: *See—*
Schaefer, Axel; Motika, Werner; Bender, Wolfgang; Todt, Jorn; and Oels, Udo, 4,389,344, Cl. 260-369.000.
Ogasawara, Hiroshi; and Takai, Miyao, to Nissan Motor Company, Limited. Fuel injection timing control system for a Diesel engine. 4,388,909, Cl. 123-501.000.
Ogata, Yoshihiro; and Abe, Yoshihiro, to Ricoh Company, Ltd. Transfer sheet separating/conveying apparatus for use in electrophotographic copying machines. 4,389,112, Cl. 355-3.0TR.
Ogawa, Naoki: *See—*
Shimada, Kiyoshi; and Ogawa, Naoki, 4,388,899, Cl. 123-198.00E.
Ogawa, Toshihisa: *See—*
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, 4,388,903, Cl. 123-440.000.
Ogawa, Toshio: *See—*
Nishimura, Shigeoki; Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,389,253, Cl. 134-1.000.
Ogino, Etsuo: *See—*
Nakanishi, Takeshi; Harada, Kazuo; Yoshida, Nobuyuki; and Ogino, Etsuo, 4,389,306, Cl. 209-5.000.
O'Hanlon, Peter J.; and Rogers, Norman H., to Beecham Group Limited. Esters of monic acid A useful as antibacterial and antimycoplasmal agents. 4,389,410, Cl. 424-283.000.
Ohio State University Research Foundation, The: *See—*
Shore, Sheldon G.; and Hsu, Wen-Liang, 4,389,347, Cl. 260-429.0CY.
Ohishi, Michiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Ocular optical system. 4,389,097, Cl. 350-410.000.
Ohkubo, Toyokazu: *See—*
Iio, Toshimasa; and Ohkubo, Toyokazu, 4,389,248, Cl. 75-99.000.
Ohmichi, Hitoshi: *See—*
Enomoto, Hiromu; Yasuda, Yasushi; Mitono, Yoshiharu; Imaizumi, Taketo; and Ohmichi, Hitoshi, 4,388,755, Cl. 29-577.00C.
Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Motoori, Ryuzo, to Nippon Kogaku K.K. Power supply control circuit in a camera. 4,389,108, Cl. 354-50.000.
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Yamasoba, Takahiko; Tsuchiko, Susumu; and Yoshino, Takashi, to Toyo Ink Manufacturing Co., Ltd. Process for preparing laminates. 4,389,438, Cl. 428-35.000.
Oishi, Kengo; Moriwaki, Masayoshi; Suzuki, Osamu; and Kamiyama, Kouji, to Fuji Photo Film Co., Ltd. Magnetic tape guide means. 4,389,010, Cl. 226-196.000.
Oishi, Kengo; Suzuki, Osamu; and Komiyama, Choji, to Fuji Photo Film Co., Ltd. Magnetic tape cassette including a locking mechanism. 4,389,690, Cl. 360-132.000.
Oka, Yukihiko: *See—*
Homma, Yoshikiyo; Shimogawara, Jun; Nagata, Muneyoshi; Oka, Yukihiko; Koyanagi, Yukiaki; Hosoya, Yukiyoshi; and Hada, Takashi, 4,389,126, Cl. 400-82.000.
Okajima, Kunihiko; Kamide, Kenji; and Matsui, Toshihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Cellulose sulfate salt having anticoagulating action and process for preparing same. 4,389,523, Cl. 536-59.000.
Okamura, Shozo; Nakajima, Hidemasa; Marukawa, Katsukiyo; Anezaki, Shoji; and Hirata, Takeyuki, to Sumitomo Metal Industries. Gasification process of solid carbonaceous material. 4,389,246, Cl. 75-60.000.
Okazaki, Kenji: *See—*
Dickson, James; Okazaki, Kenji; and Sanders, Thomas H., 4,389,258, Cl. 148-3.000.
Okazov, Shamil T.: *See—*
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.
Okuma, Akitoshi: *See—*
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Okuyama, Kiyotaka: *See—*
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Olin Corporation: *See—*
Rothgery, Eugene F.; and Scott, Robert N., 4,389,327, Cl. 252-188.280.
Wojtowicz, John A., 4,389,318, Cl. 210-755.000.
Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., 4,388,962, Cl. 164-455.000.
Olivieri, Roberto; Fascetti, Eugenio; Ciuffolotti, Pierluigi; and Degen, Ludwig, to E.N.I. Ente Nazionale Idrocarburi. Uricase production method. 4,389,485, Cl. 435-191.000.
Olson, Kenneth E.: *See—*
Feit, Yoseph; Kilanowski, David R.; and Olson, Kenneth E., 4,389,386, Cl. 423-365.000.
Olympus Optical Co., Ltd.: *See—*
Furuta, Kenzi, 4,389,685, Cl. 360-72.200.
Imai, Toshihiro, 4,389,099, Cl. 350-464.000.
Kimura, Tadashi; Hashimoto, Akihiko; and Kidawara, Atsushi, 4,389,566, Cl. 250-204.000.
Kondo, Isao; and Nakamura, Hiroaki, 4,389,596, Cl. 315-151.000.
Omnichem, S.A.: *See—*
Hannart, Jean A., 4,389,405, Cl. 424-262.000.
Omura, Yoshiaki: *See—*
Mori, Fumio; Shiono, Manzo; and Omura, Yoshiaki, 4,389,412, Cl. 424-305.000.
Onal, Hasan F., to Edison International, Inc. High speed centrifugal pump and method for operating same at reduced noise levels. 4,389,160, Cl. 415-206.000.
Onishi, Shunichi; Obara, Masaharu; Sakurai, Masaru; Murakami, Junzo; and Makino, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Hoso Kyokai. Automatic equalizer ulitizing a preiodically contained reference signal. 4,389,623, Cl. 333-16.000.
Ono, Shoichi; and Yokoo, Kuniyoshi, to Tohoku University. Ion pump for producing an ultrahigh degree of vacuum. 4,389,165, Cl. 417-49.000.
Oomen, Johannes H. C. M.: *See—*
Trentelman, Christiaan C. M.; van Dijk, Johannis C.; and Oomen, Johannes H. C. M., 4,389,317, Cl. 210-715.000.
Oota, Hisatoshi: *See—*
Torii, Taketsugu; Oota, Hisatoshi; and Arai, Hiroshi, 4,389,639, Cl. 340-539.000.

Opitz, Konrad: *See*—
Schneider, Manfred; Kruse, Hubert; and Opitz, Konrad, 4,389,213, Cl. 8-524.000.

Opprecht, Paul. Apparatus for applying a protective coating to the welding or solder seam of can bodies. 4,388,891, Cl. 118-215.000.

Optimetrix Corporation: *See*—
Phillips, Edward H., 4,389,701, Cl. 362-308.000.

Orejola, Wilmo C. Electrocardiogram caliper. 4,388,759, Cl. 33-1.00C.

Orloff, Leslie M.: *See*—
Missan, Richard S.; and Orloff, Leslie M., 4,389,679, Cl. 360-12.000.

Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
deNora, Oronzio, 4,389,289, Cl. 204-128.000.
Pellegri, Alberto, 4,389,298, Cl. 204-288.000.

Orru, Vittoria: *See*—
Di Schiena, Michele; and Orru, Vittoria, 4,389,407, Cl. 424-271.000.

Osaka Vacuum Chemical Co., Ltd.: *See*—
Adachi, Ryuichi; Yamada, Isao; and Takeshita, Kazuhiro, 4,389,299, Cl. 204-298.000.

Osawa Press Mdg., Co., Ltd.: *See*—
Hara, Akinori; and Mochizuki, Hiroshi, 4,388,953, Cl. 140-149.000.

Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha; and Toshiba Chemical Products Company. Production of laminate for receiving chemical plating. 4,389,268, Cl. 156-150.000.

Oshima, Yoshimitsu: *See*—
Hotta, Masao; Miyamoto, Yoshikazu; Yokozawa, Norio; and Oshima, Yoshimitsu, 4,389,711, Cl. 364-556.000.

Ostermayer, Frederick W., Jr.: *See*—
Kohl, Paul A.; Ostermayer, Frederick W., Jr.; and Wolowodiuk, Catherine, 4,389,291, Cl. 204-129.300.

Ostwald, Fritz, to ITT Industries, Inc. Arrangement for the supply of pressure to brake slip control apparatus. 4,389,076, Cl. 303-92.000.

Otis Engineering Corporation: *See*—
Setterberg, John R., Jr., 4,388,970, Cl. 166-382.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Adachi, Masakazu, 4,389,392, Cl. 424-1.000.

Ovieve, Gerard: *See*—
Carminati, Jean; Ehret, Thomas; Ovieve, Gerard; and Thoor, Henry-Albert, 4,388,948, Cl. 137-615.000.

Owens-Corning Fiberglas Corporation: *See*—
Sanders, James E., 4,389,024, Cl. 242-18.00G.
Shofner, Frederick M.; Greene, Neil E.; and Hanna, Terry J., 4,389,574, Cl. 250-561.000.

Owens-Illinois, Inc.: *See*—
Barkhau, Marvin L.; Perry, Philip D.; and Pimm, Roland F., 4,389,725, Cl. 373-40.000.

Oy E. Sarlin AB: *See*—
Sarvanne, Hannu, 4,389,159, Cl. 415-219.00A.

Ozawa, Toshiaki: *See*—
Kondo, Hiroatsu; Ozawa, Toshiaki; and Miyakawa, Hideaki, 4,389,131, Cl. 400-157.200.

Ozite Corporation: *See*—
Pickens, Robert C., Jr.; Kirchherr, Patricia R.; and Thomas, Reese R., 4,389,442, Cl. 428-92.000.
Thomas, Reese R.; Ellicson, John W.; and Somerville, Ronald, 4,389,443, Cl. 428-92.000.

Paffhausen, Hans: *See*—
Kohle, Ulrich; and Paffhausen, Hans, 4,389,449, Cl. 428-203.000.

Palamand, S. R., to Busch Industrial Products Corporation. Method for controlling light stability in malt beverages and product thereof. 4,389,421, Cl. 426-330.400.

Palm, Michael M., to Dresser Industries, Inc. Stiffleg construction for power shovels. 4,389,152, Cl. 414-694.000.

Palmer, James K.; and Kinzer, Charles E. Method for measuring the depth of a liquid body. 4,388,827, Cl. 73-302.000.

Pampalone, Thomas R., to RCA Corporation. Sulfur diox.de cured coatings. 4,389,433, Cl. 427-341.000.

Pampouchidis, Georgios; Daimer, Wolfgang; and Verdino, Heiner, to Vianova Kunstharz, A.G. Cathodically depositable coating compositions. 4,389,509, Cl. 524-591.000.

Panicci, Richard L., to Kiddie Products, Inc. Self-righting training cup. 4,388,996, Cl. 220-70.000.

Pantke, Reinhard; and Hofmann, Konrad, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Motor vehicle hinge. 4,388,744, Cl. 16-273.000.

Parkhurst, Ross A.; Rodkey, David L.; and Wedel, John O., to United States of America, Army. Dual channel correlator for an FM-CW ranging radar. 4,389,649, Cl. 343-17.500.

Parks, Kenneth L., to Agrico Chemical Company. Multiple-stage thermal beneficiation process for phosphate ores. 4,389,380, Cl. 423-167.000.

Parmar, Yashvant S.: *See*—
Rushby, Robert J.; and Parmar, Yashvant S., 4,389,677, Cl. 358-280.000.

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Pasek, Eugene A.: *See*—
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Patel, Vipin N.; and Raby, Joseph S., to Harris Corporation. Dual pulse method of writing amorphous memory devices. 4,389,713, Cl. 365-163.000.

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Pearson, Erik W., to Superscope, Inc. Mode control system for a radio/tape player unit. 4,389,716, Cl. 369-6.000.

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PEMCO Corporation: *See*—
Cornwell, Robert, Jr., 4,389,694, Cl. 361-48.000.

Penn Wood Products Co.: *See*—
Bosco, Lewis R., 4,388,788, Cl. 52-390.000.

Pentapharm A.G.: *See*—
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Pepsico, Inc.: *See*—
Cooper, Adrianus A. G.; and Leopold, Phillip M., 4,389,269, Cl. 156-172.000.

Performance Industries, Inc.: *See*—
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Perignon Investments, Ltd.: *See*—
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Perlbachs, Donna J.: *See*—
Yong, Samuel H.; Perlbachs, Donna J.; Wallin, Glenn R.; and Houle, Roberta C., 4,389,420, Cl. 426-94.000.

Perna, Theodore P.; Raschke, Curt R.; and Baker, William L., Jr., to Xerox Corporation. Ink jet array. 4,389,658, Cl. 346-140.00R.

Perrey, Hermann: *See*—
Neuhaus, Karl-Friedrich; Rosenkranz, Hans J.; and Perrey, Hermann, 4,389,472, Cl. 430-10.000.

Perry, Philip D.: *See*—
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Personal Products Company: *See*—
Tritsch, Ludwig, 4,389,212, Cl. 604-389.000.

Pertuis, Philippe: *See*—
Laurent, Jean; Monnet, Bernard; and Pertuis, Philippe, 4,389,183, Cl. 425-589.000.

Peters, Jack. Releasable locking device. 4,389,135, Cl. 403-327.000.

Peterson, Carl R. Easy-to-open, pressure-resistant door assembly. 4,388,779, Cl. 49-253.000.

Peterson, Elmer R., to Baker International Corporation. Hanger and running tool apparatus and method. 4,388,971, Cl. 166-387.000.

Peterson, Steven H.: *See*—
Phillips, D. Colin; and Peterson, Steven H., 4,389,292, Cl. 204-158.00R.

Petretti, Anthony V., to Metro Hoist & Body Co., Inc. Eductor truck. 4,389,314, Cl. 210-241.000.

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Pharmacia Fine Chemicals AB: *See*—
Falk, Bengt G., 4,389,316, Cl. 210-656.000.

Philip Morris, Incorporated: *See*—
Merritt, Henry B.; and Sykes, Larry M., 4,388,932, Cl. 131-291.000.
Rainer, Norman B.; and Siwiec, Dean M., 4,388,933, Cl. 131-293.000.

Phillips, D. Colin; and Peterson, Steven H., to Westinghouse Electric Corp. Zirconium isotope separation. 4,389,292, Cl. 204-158.00R.

Phillips, Edward H., to Optimetrix Corporation. Illumination system. 4,389,701, Cl. 362-308.000.

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Phillips Petroleum Company: *See*—
Clampitt, Richard L., 4,389,320, Cl. 252-8.55R.
Eastman, Alan D.; and Gardner, Lloyd E., 4,389,304, Cl. 208-254.00H.
Eastman, Alan D., 4,389,337, Cl. 252-462.000.
Gardner, Lloyd E.; Farha, Floyd E., Jr.; Eastman, Alan D.; and Drehman, Lewis E., 4,389,305, Cl. 208-254.00H.
O'Brien, Sharon R., 4,389,351, Cl. 261-36.00R.

Piampiano, Carl P. Eyeglass temple bar retaining means. 4,389,102, Cl. 351-123.000.

Pickens, Robert C., Jr.; Kirchherr, Patricia R.; and Thomas, Reese R., to Ozite Corporation. Wall covering fabric with texturized loops. 4,389,442, Cl. 428-92.000.

Pierre Fabre, S.A.: *See*—
Dussourd D'Hinterland, Lucien; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,389,396, Cl. 424-92.000.

Pietz, Siegfried: *See*—
Klatt, Karl-Heinz; Pietz, Siegfried; and Wenzl, Helmut, 4,389,239, Cl. 75-0.50R.

Pigeon, Michel; Vienot, Claude; and Saglio, Robert, to Commissariate a l'Energie Atomique. Apparatus for displacing a sensor into a tube and automatically retarning it. 4,389,611, Cl. 324-220.000.

Pike, John C., to Blackfire Coal Products. Production of solid fuel shapes from coal fines. 4,389,218, Cl. 44-6.000.

Pilboue, Pierre, to Trefileries et Cableries Chiers-Chatillon-Gorcy. Apparatus for winding wire net with simple twist. 4,389,025, Cl. 242-55.000.

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Yong, Samuel H.; Perlbachs, Donna J.; Wallin, Glenn R.; and Houle, Roberta C., 4,389,420, Cl. 426-94.000.

Pimm, Roland F.: *See*—
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Pinel, Anne-Marie: *See*—
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Piotrowski, Paul A.: *See*—
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Pitney Bowes Inc.: *See*—
Westerman, Theodore N., 4,389,114, Cl. 355-3.0FU.

Pizzuti, Donato F., to Polaroid Corporation. Folding camera. 4,389,110, Cl. 354-126.000.

Plasse, Paul A., to Polaroid Corporation. Laminar cells and batteries. 4,389,470, Cl. 429-152.000.

Plattner, Jacob J., to Abbott Laboratories. Diphenyl ether, diphenyl thioether and diphenyl methane phenol mannich bases. 4,389,416, Cl. 424-309.000.

Plummer, Walter A. One-piece molded toggle clamp. 4,388,747, Cl. 24-255.0SL.

Poad, William J.: *See*—
Dembicki, Michael T.; and Poad, William J., 4,389,266, Cl. 156-69.000.

Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans-Hermann, to Bayer AG. Filler-containing bead polymers. 4,389,507, Cl. 524-460.000.

Pohl, Gerhard: *See*—
Werle, Peter; Merk, Wolfgang; Pohl, Gerhard; and Hoevels, Friedhelm, 4,389,333, Cl. 252-401.000.

Pohl, Knut D.: *See*—
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Pizzuti, Donato F., 4,389,110, Cl. 354-126.000.
Plasse, Paul A., 4,389,470, Cl. 429-152.000.

Poleshuk, Michael; and Wysocki, Joseph J., to Xerox Corporation. Method of making planar thin film transistors, transistor arrays. 4,389,481, Cl. 430-319.000.

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Datta, Pabitra; Poliniak, Eugene S.; and Ban, Vladimir S., 4,389,441, Cl. 428-65.000.

Polman, Herman A., to Chevron Research Company. Permeable grass-like sport surface with fused glass membrane. 4,389,434, Cl. 428-17.000.

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Popov, Nikolai N.: *See*—
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Portier, Josik: *See*—
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Posner, Ronald S.; Burr, Charles R., Jr.; and Campbell, David K., to Harris Corporation. Digitally-controlled analog encrypton. 4,389,671, Cl. 358-124.000.

Post, Stephen F., to William M. Brobeck & Associates. Electric motor controller. 4,389,602, Cl. 318-341.000.

Powell, Fred B.: *See*—
Hajost, Mark J.; Crevling, Robert L.; and Powell, Fred B., 4,388,920, Cl. 128-80.00C.

Powell, Walter W., to Anderson, Greenwood & Co. Pressure relief device. 4,388,940, Cl. 137-70.000.

Power Management Corporation: *See*—
Hancock, Harold E., 4,389,691, Cl. 361-8.000.

PPG Industries, Inc.: *See*—
Korach, Malcolm, 4,389,297, Cl. 204-252.000.

Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co.: *See*—
Schneider, Eberhard; Vitt, Theodor; and Sturm, Gerd, 4,388,745, Cl. 16-288.000.

Preiss, Michael; and Schutt, Hermann, to Bayer Aktiengesellschaft. Optically pure heterocyclic aminoacid compounds, a process for their use for the synthesis of medicaments. 4,389,489, Cl. 435-280.000.

Price, Herbert B., to Spencer Wright Industries, Inc. Hand-held tufting machines. 4,388,881, Cl. 112-80.000.

Price, Macy J. Sealing and storage ring with latch apparatus. 4,388,991, Cl. 206-53.000.

Priddy, Duane B.; and Roe, James M., to Dow Chemical Company, The. Hydrogenation of phenylacetylene prior to styrene polymerization. 4,389,517, Cl. 526-64.000.

Probe Systems, Inc.: *See*—
Jackson, David W., 4,389,093, Cl. 350-162.140.

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Hajost, Mark J.; Crevling, Robert L.; and Powell, Fred B., 4,388,920, Cl. 128-80.00C.

Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferdinand, to Maschinenfabrik Hennecke GmbH. Apparatus for producing a reaction mixture of fluid components forming a foam or solid material. 4,389,375, Cl. 422-111.000.

Proust, Francois O.: *See*—
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,389,020, Cl. 241-24.000.

PSI Energy Systems, Inc.: *See*—
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Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Hübner, Heinz-Joachim, 4,389,497, Cl. 523-116.000.

Putman, Richard E.: *See*—
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Q Corporation: *See*—
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Qualls, Ned S., to Armstrong World Industries, Inc. Swivel cell light fixture. 4,389,699, Cl. 362-217.000.

Queen's University at Kingston: *See*—
Boadway, John D., 4,389,307, Cl. 209-211.000.

Queffelec, Corentin; Bordet, Rene; and Malinowsky, Marc, to Electricite de France (Service National), by said Rene Bordet. Cooling towers. 4,388,785, Cl. 52-222.000.

Raby, Joseph S.: *See*—
Patel, Vipin N.; and Raby, Joseph S., 4,389,713, Cl. 365-163.000.

Raffel, Reiner: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferdinand, 4,389,375, Cl. 422-111.000.

Rainer, Norman B.; and Siwiec, Dean M., to Philip Morris, Inc. Tobacco stem treatment and expanded tobacco product. 4,388,933, Cl. 131-293.000.

Ramsay, John D. F., to United Kingdom Atomic Energy Authority. Production of porous gels and ceramic materials. 4,389,385, Cl. 423-338.000.

Ranganathan, Ramachandran: *See*—
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Rankin, Alexander. Current carrying constant force brush holder assembly. 4,389,588, Cl. 310-242.000.

Raschke, Curt R.: *See*—
Perna, Theodore P.; Raschke, Curt R.; and Baker, William L., Jr., 4,389,658, Cl. 346-140.00R.

Rasmussen, John P., to Goodyear Aerospace Corporation. Braking system test circuit. 4,389,710, Cl. 364-551.000.

Rausch, Werner: *See*—
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; Rothkegel, Josef; and Volling, Gudrun, 4,389,260, Cl. 148-6.15Z.

Rayburn, Charles C.: *See*—
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RCA Corporation: *See*—
Balaban, Alvin R.; Steckler, Steven A.; and Fernsler, Ronald E., 4,389,676, Cl. 358-243.000.
Datta, Pabitra; Poliniak, Eugene S.; and Ban, Vladimir S., 4,389,441, Cl. 428-65.000.
Limberg, Allen L., 4,389,619, Cl. 330-288.000.
Pampalone, Thomas R., 4,389,433, Cl. 427-341.000.
Weber, Donald M.; and Alleman, Raymond A., 4,389,279, Cl. 156-640.000.

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Rees, Spencer C., to Wen Products, Inc. Electric powered wet stone. 4,388,780, Cl. 51-128.000.

Reinhard, Friedrich, to Perignon Investments, Ltd. Synthetic hormone-like peptides and method for their synthesis. 4,389,342, Cl. 260-112.50R.

Reissmann, Hermann A. W.; and Milo, Bernd T., to Lever Brothers Company. 25 To 65 wt. % fat content water-in-oil emulsion spread whose aqueous phase comprises a gelling system. 4,389,426, Cl. 426-602.000.

Reiter, John J. Switch actuating mechanism. 4,389,550, Cl. 200-44.000.

Remington Ind. E Com. De Sistemas Para Escritoria S.A.: *See*—
Giolitti, Nicolo, 4,389,130, Cl. 400-144.200.

Renirie, Alexis C. M.; Mensink, Kornelis A.; and Wittkampf, Frederik H. M., to Vitafin N.V. Programmable pacer and method of external programming. 4,388,929, Cl. 128-419.0PG.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,388,985, Cl. 188-65.400.

Republic Steel Corporation: *See*—
Blair, Matthew J.; Wiktorowski, Thomas A.; and Wogan, W. Dale, 4,389,245, Cl. 75-58.000.

Rettich, Renate; and Schwedes, Wilhelm, to Licentia Patent-Verwaltungs-GmbH. Method and arrangement for coating orifice walls. 4,389,430, Cl. 427-230.000.
Revue Thommen AG: *See*—
Dubois, Gerald; and Kenel, Kaspar, 4,389,122, Cl. 368-110.000.
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Michalik, Anthony J., 4,388,990, Cl. 198-645.000.
Ribet, John N.: *See*—
Bendyshe Walton, Andre P. J.; Townsend, Francis H.; and Ribet, John N., 4,389,580, Cl. 307-400.000.
Ricard, Claude F. Taximeter system for avoiding operator fraud in the computation and display of trip fares. 4,389,563, Cl. 377-20.000.
Richard, Spence, Jr. Wheelchair cover. 4,389,057, Cl. 280-289.0WC.
Richards, Elmer A.; and Davis, Alan R., to Eaton Corporation. Multiple countershaft simple transmission. 4,388,838, Cl. 74-331.000.
Richter, Rudolf; and Kropp, Walter, to Linde Aktiengesellschaft. Valves. 4,388,946, Cl. 137-596.200.
Richter, Thomas A. Optical system. 4,389,115, Cl. 355-26.000.
Rickbeil, Kenneth W. Camber correction tool. 4,388,820, Cl. 72-458.000.
Ricoh Company, Ltd.: *See*—
Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, 4,389,113, Cl. 355-3.0DD.
Ogata, Yoshihiro; and Abe, Yoshihiro, 4,389,112, Cl. 355-3.0TR.
Riddle, Herbert S., Jr. Encoding/decoding syncronization technique. 4,389,636, Cl. 340-347.0DD.
Rideout, Merle C., Jr. Power plants deriving their energy from expansion and contraction. 4,388,805, Cl. 60-527.000.
Riedel, Elmer E., to Triad Metal Products Company, The. Band clamping device. 4,388,748, Cl. 24-269.000.
Riedhammer, Josef, to Danfoss A/S. Apparatus for producing a rotary speed-dependent control pressure. 4,388,941, Cl. 137-82.000.
Riedl, Franz, to Wacker-Werke GmbH & Co. KG. Oscillator for soil or road tampers. 4,389,137, Cl. 404-113.000.
Riegger, Helmut: *See*—
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Ries, Peter E., to Pentapharm A.G. Process for the preparation of a collagen product for medical and cosmetic purposes. 4,389,487, Cl. 435-273.000.
Riesgraf, Diane A., to Gillette Company, The. Erasable inks containing thermoplastic block copolymers. 4,389,499, Cl. 523-161.000.
Righi, Bruno, to Centro Automazioni Moderne S.p.A. Automatic machine for forming packaging cases. 4,389,205, Cl. 493-315.000.
Ristow, Dietrich: *See*—
Mueller, Jan-Erik; Ristow, Dietrich; and Kniepkamp, Hermann, 4,389,280, Cl. 156-645.000.
Rittenbach, Otto F.: *See*—
Fanuele, Michael A.; McCray, Joseph A.; and Rittenbach, Otto F., 4,389,647, Cl. 343-7.700.
Rizzello, Frank. Phonograph decoupling apparatus and method. 4,389,718, Cl. 369-247.000.
Roba, Giacomo: *See*—
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Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,388,908, Cl. 123-500.000.
Grimm, Gerold; Rose, Klaus; Kemmner, Ulrich; Schillinger, Rainer; and Stemmer, Alois, 4,388,913, Cl. 123-585.000.
Linder, Ernst; Muller, Klaus; and Maurer, Helmut, 4,389,373, Cl. 422-98.000.
Robitzsch, Herbert, 4,389,664, Cl. 358-22.000.
Sander, Klaus; and Wurth, Hans, 4,389,692, Cl. 361-29.000.
Schustek, Siegfried E., 4,389,589, Cl. 310-258.000.
Roberts, Shephard D. Combination applicator-dispenser hair styler. 4,388,936, Cl. 132-88.500.
Robertson Paper Box Co., Inc.: *See*—
Berry, Chapman; and Hackenberg, Robert A., 4,388,999, Cl. 220-416.000.
Robitzsch, Herbert, to Robert Bosch GmbH. System and method to derive a digital video control signal. 4,389,664, Cl. 358-22.000.
Rockwell International Corporation: *See*—
Anders, Ronald J., 4,389,037, Cl. 251-327.000.
Decker, D. Richard, 4,389,660, Cl. 357-22.000.
French, Barry T.; and McNutt, Michael J., 4,389,615, Cl. 329-101.000.
Soclof, Sidney I., 4,389,429, Cl. 427-90.000.
White, Stanley A., 4,389,538, Cl. 179-1.0SA.
Rodgers, David T.; Tursi, Thomas P.; and Bryan, Thomas J., to United States of America, Navy. Handhole seat resurfacing tool for naval pressure fired boilers. 4,388,782, Cl. 51-241.00A.
Rodkey, David L.: *See*—
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Rody, Marc P. N.; and Sudia, Frank W. Process and apparatus for generation of steam via catalytic combustion. 4,388,892, Cl. 122-4.00D.
Roe, James M.: *See*—
Priddy, Duane B.; and Roe, James M., 4,389,517, Cl. 526-64.000.
Rogers, Norman H.: *See*—
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Rohm and Haas Company: *See*—
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Smolanoff, Joel R., 4,389,401, Cl. 424-248.560.
Rolf, Meinhard: *See*—
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Romero, Eduardo: *See*—
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Roosa, Peter V.; and Roosa, Vernon D. Tank flushing means. 4,388,736, Cl. 4-324.000.
Roosa, Vernon D.: *See*—
Roosa, Peter V.; and Roosa, Vernon D., 4,388,736, Cl. 4-324.000.
Rosa, Bernard. Variable camshaft assembly. 4,388,897, Cl. 123-90.170.
Rosaen, Nils O., to Universal Flow Monitors. Fluid flow meter. 4,388,835, Cl. 73-861.580.
Rose, Klaus: *See*—
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Rosenberg, Kenneth W., to United States of America, Navy. Rotary latch. 4,389,062, Cl. 292-190.000.
Rosenbluth, Robert F.: *See*—
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Rosenkranz, Hans J.: *See*—
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Rosenthal, Joel W.: *See*—
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Ross, Donald R. Apparatus and a process for heating material. 4,389,332, Cl. 252-378.00R.
Rothgery, Eugene F.; and Scott, Robert N., to Olin Corporation. Use of selected 1,2-dihydro-1,2,4,5-tetrazines as oxygen-scavenging agents. 4,389,327, Cl. 252-188.280.
Rothkegel, Josef: *See*—
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; Rothkegel, Josef; and Volling, Gudrun, 4,389,260, Cl. 148-6.15Z.
Rotolico, Anthony J.; and Romero, Eduardo, to Eutectic Corporation. Plasma-transferred-arc torch construction. 4,389,559, Cl. 219-121.0PP.
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Rouffet, Denis, to U.S. Philips Corporation. Method for controlling the clock phase of a receiving system for digital data, phase recovery circuit for effectuating this method and digital data receiving system comprising said circuit. 4,389,727, Cl. 375-110.000.
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Capuano, Terry D., 4,389,145, Cl. 408-1.00R.
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Clemente, Stefano; Pelly, Brian R.; and Ruttonsha, Rutton, 4,389,702, Cl. 363-21.000.
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Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.
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De Bellis, Ferruccio, 4,388,930, Cl. 128-419.0PS.
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Burton, Colin K., 4,389,418, Cl. 424-365.000.

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Simmonds, Michael B.; and Giffard, Robin P., 4,389,612, Cl. 324-248.000.

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Nagao, Nobuya; and Sakai, Teturou, 4,389,665, Cl. 358-23.000.

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Innis, Charles L., Jr.; Salter, Lowell S., Jr.; Boghosian, Harry; and Wilkinson, Donald H., 4,389,053, Cl. 277-95.000.

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Danner, Bernard; Mau, Hartmut; and Stettler, Hans, 4,389,259, Cl. 148-6.15R.

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Morikawa, Eiji; Morita, Toshifumi; and Hirate, Masayuki, 4,389,548, Cl. 179-110.00A.

Sarcia, Domenico S., to CVI Incorporated. Cryogenic refrigerator. 4,388,809, Cl. 62-6.000.

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Grabley, Susanne; and Sauber, Klaus, 4,389,488, Cl. 435-280.000.

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Eber, David H.; and Sauls, John R., 4,389,171, Cl. 418-15.000.

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Scarrott, Gordon G., to International Computers Limited. Magnetic recording systems. 4,389,682, Cl. 360-45.000.

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Schadt, Martin: *See*—
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Schaefer, Axel; Motika, Werner; Bender, Wolfgang; Todt, Jorn; and Oels, Udo, to Bayer Aktiengesellschaft. Process for separating solid 1,5- and/or 1,8-dinitroanthraquinone and liquid nitrobenzene. 4,389,344, Cl. 260-369.000.

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Schafer, Paul; Abel, Heinz; and Mayer, Fritz, to Ciba-Geigy Corporation. Propylene oxide reaction products, process for their manufacture and their use. 4,389,214, Cl. 8-527.000.

Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic relay with adjustable contacts in a closed contact chamber. 4,389,626, Cl. 335-78.000.

Schell, William F.: *See*—
Deibele, Florian C.; and Schell, William F., 4,389,551, Cl. 200-51.00R.

Schelleng, Robert D., to Novamet, Inc. Process for producing lithium-metal master alloy. 4,389,241, Cl. 75-0.50R.

Schenkel, Robert H., to American Cyanamid Company. Method for the control of cattle grubs using pentadienone hydrazones. 4,389,402, Cl. 424-251.000.

Schering Corporation: *See*—
Cooper, David J.; Waitz, Jay A.; Counelis, Mae; and Weinstein, Jay, 4,389,398, Cl. 424-181.000.

Schickedanz, Willi. Receiver for a two channel television sound. 4,389,536, Cl. 179-1.00G.

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Schilling, Dean W. Cryogenic device and method. 4,388,814, Cl. 62-62.000.

Schilling, Walter W., to MacMillan Bloedel Limited. Multiple blade splitting device. 4,388,957, Cl. 144-366.000.

Schillinger, Rainer: *See*—
Grimm, Gerold; Rose, Klaus; Kemmner, Ulrich; Schillinger, Rainer; and Stemmer, Alois, 4,388,913, Cl. 123-585.000.

Schindler, Rudolf: *See*—
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Schipper, Edgar: *See*—
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Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,388,908, Cl. 123-500.000.

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Vig, Michael A.; and Schmidt, Donald K., 4,388,980, Cl. 180-271.000.
Schmidt, Jorn M., to Danfoss A/S. Method for making a bellows unit. 4,389,558, Cl. 219-119.000.
Schmidt, LaVern. Compact position lock parts bin. 4,389,077, Cl. 312-244.000.
Schmitt, Armin; and Nosthinski, Rudiger. Process for the continuous roasting of cocoa kernel paste. 4,389,427, Cl. 426-631.000.
Schmitt, Werner; Purrmann, Robert; Jocham, Peter; and Hubner, Heinz-Joachim, to Espe Fabrik parmazeutischer Praparate GmbH. Use of agglomerates of silicic acid as fillers in dental materials. 4,389,497, Cl. 523-116.000.
Schmitt, Werner H.: *See*—
Edmunds, George W.; McVeigh, George S.; and Schmitt, Werner H., 4,388,989, Cl. 198-339.000.
Schmoock, Roy F., to Fischer & Porter Company. Electromagnetic flowmeter having a monolithic conduit. 4,388,834, Cl. 73-861.120.
Schneider, Eberhard; Vitt, Theodor; and Sturm, Gerd, to Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co. Self closing multi pintle hinge. 4,388,745, Cl. 16-288.000.
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Schober, Robert C., to American Hospital Supply Corporation. Programmable digital cardiac pacer. 4,388,927, Cl. 128-419.0PG.
Schor, Joseph M.; Nigalaye, Ashok; and Gaylord, Norman G., to Forest Laboratories, Inc. Sustained release therapeutic compositions based on high molecular weight hydroxypropylmethylcellulose. 4,389,393, Cl. 424-19.000.
Schubert, Hiltmar A. O.: *See*—
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Schulz, Hans-Hermann: *See*—
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Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,389,507, Cl. 524-460.000.
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Schustek, Siegfried E., to Robert Bosch GmbH. Dynamo electric machine-internal combustion engine combination structure. 4,389,589, Cl. 310-258.000.
Schutt, Hermann: *See*—
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Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles. 4,389,495, Cl. 521-56.000.
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Scientific Systems, Inc.: *See*—
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Scott, Paul R., to Shell Oil Company. Pipeline pig. 4,389,461, Cl. 428-543.000.
Scott, Robert N.: *See*—
Rothgery, Eugene F.; and Scott, Robert N., 4,389,327, Cl. 252-188.280.
Scriabine, Alexander, to Merck & Co., Inc. Method of treating hypertension. 4,389,415, Cl. 424-309.000.
Scrutton, Simon L.; Marwick, William F. G.; and Wilson, David R., to Letraset USA, Inc. Production of transfer material. 4,389,473, Cl. 430-17.000.
Sealy, Incorporated: *See*—
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Seaman Nuclear Corporation: *See*—
Fehrenbach, Robert J., 4,389,136, Cl. 404-75.000.
Seeney, Charles E.; Kraemer, John F.; and Varnum, Nancy C., to International Minerals & Chemical Corp. Oxidatively coupled coldset binders. 4,389,498, Cl. 523-139.000.
Segawa, Takashi: *See*—
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Seibel, Markus: *See*—
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Seidler, Robert L. Flasher unit with synchronization and daylight control. 4,389,632, Cl. 340-74.000.
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Seiler, Gunter: *See*—
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Seiler, Louis, Jr.: *See*—
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Ahlers, Egon, 4,388,954, Cl. 141-39.000.
Seki, Katsumi; Tachi, Yasuo; and Shibata, Yoji, to Hitachi, Ltd. Cold trap. 4,389,310, Cl. 210-183.000.
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Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.
Sekiyama, Nobuo; and Miyamura, Hisato, to Hitachi, Ltd. Synchronous motor control device. 4,389,607, Cl. 318-717.000.
Sena, Ted: *See*—
Crews, Harold R.; Carter, James H., II; and Sena, Ted, 4,389,490, Cl. 436-17.000.
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Sengoku, Ikuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and a device for fixing a window molding onto a windowpane. 4,389,069, Cl. 296-206.000.
Setterberg, John R., Jr., to Otis Engineering Corporation. Apparatus and method for controlling injection fluid flow in a well annulus. 4,388,970, Cl. 166-382.000.
Sevink, Theodor J. Support of suspension of insulating material. 4,389,190, Cl. 432-247.000.
Seyffert, Michael; and Taatjes, Steven W., to National Semiconductor Corporation. Edge contacting plating electrode. 4,389,296, Cl. 204-206.000.
Shafran, Dimitry. Heat generator for a circulating heating system. 4,388,915, Cl. 126-247.000.
Shaft Lok Inc.: *See*—
Badzinski, Richard D.; and Nigel, George G., 4,389,199, Cl. 440-74.000.
Shalaby, Shalaby W.; and Schipper, Edgar, to Ethicon, Inc. High compliance monofilament surgical sutures comprising poly[alkylene terephthalate-co-(2-alkenyl or alkyl)succinate]. 4,388,926, Cl. 128-335.500.
Shandy, Walter V.; and Voytilla, Jospeh M., to West Company, The. Method for making molded articles. 4,389,271, Cl. 156-242.000.
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Nakanishi, Yasuhiro; and Fujikawa, Yoshiyuki, 4,389,641, Cl. 340-709.000.
Shea, H. Richard, Jr. Triangular solar collector. 4,388,917, Cl. 126-450.000.
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Graiff, Leonard B.; Heldeweg, Rudolf F.; and Leenaars, Corrie M. J., 4,389,221, Cl. 44-66.000.
Scott, Paul R., 4,389,461, Cl. 428-543.000.
Sheppard, Douglas P., to Mostek Corporation. Semiconductor memory circuit with depletion data transfer transistor. 4,389,705, Cl. 365-104.000.
Sheridan, Stephen E.; and Hundertmark, James M., to Brunswick Corporation. Lubricating system for a two-cycle engine. 4,388,896, Cl. 123-73.0AD.
Sherman, Ira N., to General Electric Company. Ultrasonic probe for nondestructive inspection. 4,388,831, Cl. 73-623.000.
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Shields, Walter A. Banding machine. 4,388,797, Cl. 53-585.000.
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Shiley Inc.: *See*—
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Shimada, Masaaki: *See*—
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Shimizu, Hisashi: *See*—
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Shimizu, Masami; and Yasunobe, Junji, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Oil seal system for shaft of turbocharger. 4,389,052, Cl. 277-67.000.

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Shimomura, Masao: *See—*
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Shinn, John H.: *See—*
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Shiobara, Masaji: *See—*
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Mori, Fumio; Shiono, Manzo; and Omura, Yoshiaki, 4,389,412, Cl. 424-305.000.

Shofner, Frederick M.; Greene, Neil E.; and Hanna, Terry J., to Owens-Corning Fiberglas Corporation. Method and apparatus for detecting a break in a plurality of glass fibers. 4,389,574, Cl. 250-561.000.

Shore, Sheldon G.; and Hsu, Wen-Liang, to Ohio State University Research Foundation, The. Synthesis of heteronuclear tri-osmium carbonyl hydrides under gaseous hydrogen. 4,389,347, Cl. 260-429.0CY.

Shumsky, Viktor I.: *See—*
Zhorov, Vladimor I.; Kirsh, Jury E.; Shumsky, Viktor I.; Karaputadze, Temuri M.; and Bairamov, Jury J., 4,389,404, Cl. 424-260.000.

Sicard, Clarence. Method and apparatus for accreting fibrous filter cartridges or other tubular articles. 4,389,224, Cl. 55-55.000.

Sidorenko, Grigory N.: *See—*
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Siemens Aktiengesellschaft: *See—*
Baues, Peter, 4,389,655, Cl. 346-107.00R.
Ekwall, Christer; and Elmqvist, Hakan, 4,388,928, Cl. 128-419.0PG.
Mueller, Jan-Erik; Ristow, Dietrich; and Kniepkamp, Hermann, 4,389,280, Cl. 156-645.000.
Schedele, Helmut, 4,389,626, Cl. 335-78.000.

Siemens Corporation: *See—*
Wagner, Theodore W.; Liang, Sam; and Muzumdar, Deepak R., 4,389,544, Cl. 179-2.0DP.
Wagner, Theodore W.; Liang, Sam; and Muzumdar, Deepak R., 4,389,544, Cl. 179-2.0DP.

Sievers, George K.: *See—*
Clark, Eugene V.; and Sievers, George K., 4,389,439, Cl. 428-36.000.

Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, to Castolin S.A. Powder mixture for thermal spraying. 4,389,251, Cl. 75-255.000.

Simmonds, Michael B.; and Giffard, Robin P., to S.H.E. Corporation. Apparatus for reducing low frequency noise in dc biased SQUIDS. 4,389,612, Cl. 324-248.000.

Simo, Thomas; and Eisenlohr, Karl-Heinz, to Metallgesellschaft Aktiengesellschaft. Process of converting high-boiling crude oils to equivalent petroleum products. 4,389,303, Cl. 208-107.000.

Sims, Dewey M., Jr., to Northern Telecom Systems Corporation. Method and apparatus for mounting magnetic tape heads. 4,389,689, Cl. 360-109.000.

Sims, Michael H. Extended holder for a lighter. 4,389,187, Cl. 431-277.000.

Singer Company, The: *See—*
Adams, Kenneth D., 4,388,886, Cl. 112-237.000.

Singh, Raj N.; and Dusek, Joseph T., to United States of America, Energy. Porous electrolyte retainer for molten carbonate fuel cell. 4,389,467, Cl. 429-41.000.

Single Vend Inc.: *See—*
Godley, Fred O.; and Laurents, John A., 4,389,000, Cl. 221-8.000.

Sipos, Sandor. Lathe universal tool assembly. 4,389,144, Cl. 407-82.000.

Siwiec, Dean M.: *See—*
Rainer, Norman B.; and Siwiec, Dean M., 4,388,933, Cl. 131-293.000.

Skala, Stephen F. Withdrawal of molten alkali hydroxide through an electrode for depletion of water dissolved therein. 4,389,287, Cl. 204-68.000.

Skalabrin, Nicholas J. Low gold content dental alloy. 4,389,370, Cl. 420-505.000.

Skinner, Ronald W.: *See—*
Dalton, Augustine I., Jr.; Greskovich, Eugene J.; and Skinner, Ronald W., 4,389,390, Cl. 423-584.000.

Skladanovsky, Evgeny N.: *See—*
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Skutch, Maria E.: *See—*
Duncan, Charles S.; Piotrowski, Paul A.; Skutch, Maria E.; and McHugh, James P., 4,389,377, Cl. 422-246.000.

Sladek, Norbert J.; Avery, Roger P.; and Bruno, Saverio T., to Allied Corporation. Electrical connector having a captivated, electrically compensated inner conductor. 4,389,625, Cl. 333-260.000.

Slater Electric Inc.: *See—*
Slater, Thomas S.; and Bowden, Wade R., Jr., 4,389,535, Cl. 174-65.00R.

Slater, Thomas S.; and Bowden, Wade R., Jr., to Slater Electric Inc. Cable entry port means for electrical outlet box. 4,389,535, Cl. 174-65.00R.

Smeggil, John G.; and Bornstein, Norman S., to United Technologies Corporation. Zinc-aluminum hot dip coated ferrous article. 4,389,463, Cl. 428-659.000.

Smith, Ian: *See—*
Braithwaite, John C.; and Smith, Ian, 4,388,871, Cl. 104-138.00G.

Smith International, Inc.: *See—*
Oelke, Erwin S., 4,388,984, Cl. 184-54.000.

Smith, Kendall S., II: *See—*
Hellinger, David L.; Bell, Gordon D.; Brown, Gregory N.; Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,388,743, Cl. 16-116.00A.

Smith, Kenneth E.: *See—*
Marshall, Gailen; Myska, C. H.; and Smith, Kenneth E., 4,388,969, Cl. 166-242.000.

Smith, Larry G., to United Merchants & Manufacturers, Inc. Foam random dyeing system. 4,388,740, Cl. 8-151.000.

Smith, Robert M. Disco light assembly. 4,389,598, Cl. 315-291.000.

Smolanoff, Joel R., to Rohm and Haas Company. Arthropod repellents. 4,389,401, Cl. 424-248.560.

Smolinski, Manfred: *See—*
Boeke, Burkhard; Kalka, Josef; Smolinski, Manfred; and Baukholt, Heinz, 4,389,522, Cl. 528-503.000.

Snam S.p.A.: *See—*
Vinciguerra, Costantino; and Bonfiglioli, Giampaolo, 4,388,752, Cl. 29-421.00R.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Concisuro, Giuseppe; and Arcioni, Paolo, 4,389,594, Cl. 315-39.550.

Societe Anonyme dite: Les Cables de Lyon: *See—*
Trezeguet, Jean-Pierre; and Vives, Jean-Patrick, 4,388,800, Cl. 57-7.000.

S.A. Joulin Sema: *See—*
Laverriere, Stanislas G. L., 4,389,064, Cl. 294-64.00R.

s.a. PRB, societe anonyme: *See—*
Klohn, Wolfgang H. R.; Muller, Dieter H.; and Schubert, Hiltmar A. O., 4,389,264, Cl. 149-14.000.

Societe Miniere et Metallurgique de Penarroya: *See—*
Rouillard epouse Bauer, Denise; Cote, Gerard; Fossi, Paolo; and Marchon, Bruno, 4,389,379, Cl. 423-89.000.

Societe pour l'Equipement de Vehicules: *See—*
Latapie, Jean-Francois, 4,388,902, Cl. 123-425.000.

Soclof, Sidney I., to Rockwell International Corporation. Method of forming integrated circuit chip transmission line. 4,389,429, Cl. 427-90.000.

Soderstrom, Gert W. Drain pipe. 4,389,138, Cl. 405-43.000.

Sohaei, Iraj. Steerable surfboard. 4,389,195, Cl. 440-15.000.

Sokolik, Joseph E., Jr.; Kosseim, Alexander J. M.; and Atwood, Gilbert R., to Union Carbide Corporation. Regenerable process for the selective removal of sulfur dioxide from effluent gases. 4,389,383, Cl. 423-243.000.

Sokolovsky, Paul J. Firearm pneumatic slide decelerator assembly. 4,388,855, Cl. 89-198.000.

Somerville, Ronald: *See—*
Thomas, Reese R.; Ellicson, John W.; and Somerville, Ronald, 4,389,443, Cl. 428-92.000.

Sommer, Hans. Device for pickling pieces of meat. 4,388,859, Cl. 99-533.000.

Sonoboad Corporation: *See—*
Sullivan, Robert A., 4,389,601, Cl. 318-118.000.

Sonoda, Takenori: *See—*
Tanaka, Masato; Sonoda, Takenori; and Watanabe, Nobuhiko, 4,389,681, Cl. 360-27.000.

Sony Corporation: *See—*
Hamada, Osamu, 4,388,849, Cl. 84-1.180.
Kurokawa, Hironichi, 4,389,666, Cl. 358-47.000.
Suzuki, Susumu; and Okuma, Akitoshi, 4,389,675, Cl. 358-229.000.
Tanaka, Masato; Sonoda, Takenori; and Watanabe, Nobuhiko, 4,389,681, Cl. 360-27.000.
Tatami, Mitsuhige, 4,389,663, Cl. 358-19.000.
Yamaguchi, Kazuo, 4,389,620, Cl. 330-304.000.

Sorensen, James R.: *See—*
Hall, Richard A.; and Sorensen, James R., 4,389,013, Cl. 229-45.00R.

Sorenson, Richard W., to Carlingswitch, Inc. Switch construction. 4,389,552, Cl. 200-68.000.

Soubeyroux, Jean-Louis: *See—*
Tanguy, Bernard; Soubeyroux, Jean-Louis; Pezat, Michel; Portier, Josik; and Hagenmuller, Paul, 4,389,326, Cl. 252-188.260.

Source Technology Corporation: *See—*
Kramer, Gideon A., 4,389,103, Cl. 353-25.000.

Southwall Corporation, The: *See—*
Chahroudi, Day; and Brookes, John R., 4,389,452, Cl. 428-215.000.

Sovak, Milos; and Ranganathan, Ramachandran, to University of California, The Regents of the. Intermediates and synthesis of 2-amino-2-deoxytetritols. 4,389,526, Cl. 549-347.000.
Sowa, Kunihiro: *See*—
Nakano, Osamu; and Sowa, Kunihiro, 4,389,541, Cl. 179-1.0SM.
Sparton Corporation: *See*—
Cole, Frederick A., 4,389,575, Cl. 250-563.000.
Spencer, Richard H.: *See*—
Almgren, David W.; Bartoszek, John T.; Lucas, Robert M.; Berthiaume, Richard P.; Spencer, Richard H.; and Saia, William H., 4,388,964, Cl. 165-32.000.
Spencer Wright Industries, Inc.: *See*—
Price, Herbert B., 4,388,881, Cl. 112-80.000.
Sperry Corporation: *See*—
Matthews, Hugh B., 4,388,807, Cl. 60-641.400.
Minor, Ray C.; Treichler, James W.; and Bohman, Carl E., 4,389,154, Cl. 414-699.000.
Spiegel, Werner, to Thyssen Industrie AG. Buried heat exchanger. 4,388,966, Cl. 165-45.000.
Sprague Electric Company: *See*—
Gontowski, Walter S., Jr., 4,389,638, Cl. 340-384.00E.
Sprague, Robert A., to Xerox Corporation. Electro-optic line printer. 4,389,659, Cl. 346-153.100.
Spring, Gorden W., to Tomy Corporation. Pneumatically operated toy employing a movable implement. 4,388,776, Cl. 46-44.000.
Springs Mills, Inc.: *See*—
Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., 4,388,879, Cl. 112-10.000.
SPS Technologies, Inc.: *See*—
Bernard, Clay, II; Matheny, William F., III; Faith, Charles M.; Goswick, Richard L.; and Hauth, Jerry L., 4,389,157, Cl. 414-787.000.
Square D Company: *See*—
Lingaraju, Bhartoor, 4,389,082, Cl. 339-103.00R.
Stahl, Dieter: *See*—
Disselbeck, Dieter; and Stahl, Dieter, 4,389,447, Cl. 428-178.000.
Staiger, Dieter E., to International Business Machines Corporation. Method and apparatus for generating pulses of a predetermined time relation within predetermined pulse intervals with a high time resolution. 4,389,614, Cl. 328-61.000.
Standard Oil Company, The: *See*—
Weinert, Raymond J., Jr.; and Benton, Kenneth C., 4,389,334, Cl. 252-429.00B.
Standard Oil Company (Indiana): *See*—
Won, Sungkuk; and Dobson, Jerry E., 4,389,247, Cl. 75-72.000.
Stankevich, Romualda S.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.
Stanley Electric Co., Ltd.: *See*—
Teshima, Toru; Ariga, Kazuo; and Kasahara, Takao, 4,389,095, Cl. 350-334.000.
Stark, Charles J., to General Electric Company. Method for epoxidizing olefins. 4,389,529, Cl. 549-531.000.
Stauffer Chemical Company: *See*—
Patchett, Gilbert G.; Gray, Reed A.; and Hyzak, Daniel L., 4,389,237, Cl. 71-103.000.
Steag Aktiengesellschaft: *See*—
Adrian, Fritz; Sattler, Heinrich; and Sauerland, Werner, 4,389,019, Cl. 241-19.000.
Steckler, Steven A.: *See*—
Balaban, Alvin R.; Steckler, Steven A.; and Fernsler, Ronald E., 4,389,676, Cl. 358-243.000.
Stein, Jay, to American Science and Engineering, Inc. High resolution digital radiography system. 4,389,729, Cl. 378-99.000.
Stein, Marc T., to Motorola, Inc. Sample and hold circuit. 4,389,579, Cl. 307-353.000.
Steine, Hans-Theo: *See*—
Simm, Wolfgang; Steine, Hans-Theo; and Audemars, Daniel, 4,389,251, Cl. 75-255.000.
Steinmetz, Guy R.: *See*—
Larkins, Thomas H., Jr.; and Steinmetz, Guy R., 4,389,532, Cl. 568-487.000.
Stemmer, Alois: *See*—
Grimm, Gerold; Rose, Klaus; Kemmner, Ulrich; Schillinger, Rainer; and Stemmer, Alois, 4,388,913, Cl. 123-585.000.
Stenlund, Rune, to AB Vretstorp-Verken. Apparatus for movably spreading material on a railroad embankment. 4,389,150, Cl. 414-505.000.
Stepanov, Vasily V.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.
Stephenson, Robert L., to Allied Corporation. Seat belt webbing guide. 4,389,059, Cl. 280-808.000.
Stern, Richard A., to United States of America, Army. Line source antenna for electronic beam scanning. 4,389,650, Cl. 343-768.000.
Stettler, Hans: *See*—
Danner, Bernard; Mau, Hartmut; and Stettler, Hans, 4,389,259, Cl. 148-6.15R.
Steuerwald, Alfred, to Aeroquip GmbH. Rapid coupling which is operable even under pressure. 4,388,947, Cl. 137-614.060.
Stevenson, David A., to United States of America, Navy. Electrochemical deoxygenation for liquid phase epitaxial growth. 4,389,274, Cl. 156-624.000.
Stewart, Charles M.: *See*—
Bell, Melvyn R.; Morrison, John M.; and Stewart, Charles M., 4,389,697, Cl. 361-380.000.
Stielow GmbH: *See*—
Kunne, Wolfgang, 4,388,793, Cl. 53-381.00R.
Stoeckli, Oscar W. Envelope opener. 4,388,847, Cl. 83-356.300.
Stohlquist, Roger H.; and Strombeck, Leo, to Anderson Bros. Mfg. Co. Method and apparatus for filling containers. 4,388,795, Cl. 53-435.000.
Stolle Research and Development Corporation: *See*—
Tice, Thomas R.; and Lewis, Danny H., 4,389,330, Cl. 427-213.360.
Stone, Frank K. Prefabricated concrete vault. 4,388,874, Cl. 109-79.000.
Stone, Stanley A.: *See*—
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., 4,389,313, Cl. 210-198.200.
Storage Technology Corporation: *See*—
Gorove, Arpad, 4,389,687, Cl. 360-98.000.
Stouffer, Ronald D.; and Morris, Joseph W., to Bowles Fluidics Corporation. Fluid flow control element having movable valve and method. 4,388,950, Cl. 137-829.000.
Strack, Richard R., to Warner Lambert Technologies, Inc. Flexible fiber optical conduit and method of making. 4,389,089, Cl. 350-96.260.
Straumann, Fritz: *See*—
Sutter, Franz; and Straumann, Fritz, 4,388,921, Cl. 128-92.00B.
Streit, Kenneth F., to Techplastics, Inc. Modular storage unit. 4,389,078, Cl. 312-322.000.
Strombeck, Leo: *See*—
Stohlquist, Roger H.; and Strombeck, Leo, 4,388,795, Cl. 53-435.000.
Strong, Barry C.: *See*—
Atkinson, Cyril M.; and Strong, Barry C., 4,388,951, Cl. 139-11.000.
Sturm, Gerd: *See*—
Schneider, Eberhard; Vitt, Theodor; and Sturm, Gerd, 4,388,745, Cl. 16-288.000.
Suda, Kazuyoshi; Fujimura, Akira; and Tsuda, Kiyoshi, to Nippon Electric Co., Ltd. Flat-article sorting apparatus. 4,388,994, Cl. 209-564.000.
Sudia, Frank W.: *See*—
Rody, Marc P. N.; and Sudia, Frank W., 4,388,892, Cl. 122-4.00D.
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, to Mitsubishi Gas Chemical Company, Inc. Curable polyphenylene ether resin composition. 4,389,516, Cl. 525-534.000.
Sugita, Ariyasu: *See*—
Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.
Sugiura, Toshiaki, to Brother Kogyo Kabushiki Kaisha. Type wheel printer. 4,389,129, Cl. 400-144.200.
Sugiyama, Fumio: *See*—
Nakamura, Makoto; and Sugiyama, Fumio, 4,389,540, Cl. 179-1.50A.
Sugiyama, Shinichi; and Nakatomi, Takayoshi, to Toyota Jidosha Kabushiki Kaisha. Fuel injected engine control device and method performing wall-adhered fuel accounting. 4,388,906, Cl. 123-492.000.
Sugiyama, Takahiro; and Hagiwara, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Objective system for video disc. 4,389,100, Cl. 350-478.000.
Sugo, Yuko; and Yamamoto, Tadahiro, to Nissan Motor Company, Ltd. Single point fuel injected internal combustion engine and method of operating same. 4,388,907, Cl. 123-494.000.
Suhara, Manabu; Gunjima, Tomoki; and Miyake, Haruhisa, to Asahi Glass Company Ltd. Process for producing a membrane for electrolysis by forming removable thin layer upon electrode. 4,389,494, Cl. 521-27.000.
Suling, Carlhans: *See*—
Podszun, Wolfgang; Suling, Carlhans; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,389,507, Cl. 524-460.000.
Sullivan, Robert A., to Sonobond Corporation. Power supply having automatic frequency control for ultrasonic bonding. 4,389,601, Cl. 318-118.000.
Sulzbach, Hans-Michael: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Raffel, Reiner; and Althausen, Ferdinand, 4,389,375, Cl. 422-111.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kurosaki, Shiro; and Watanabe, Minoru, 4,389,233, Cl. 65-31.000.
Nakai, Tetsuo; Kono, Yuichiro; Yazu, Shuji; and Hara, Akio, 4,389,465, Cl. 428-698.000.
Sumitomo Metal Industries: *See*—
Okamura, Shozo; Nakajima, Hidemasa; Marukawa, Katsukiyo; Anezaki, Shoji; and Hirata, Takeyuki, 4,389,246, Cl. 75-60.000.
Sumitomo Metal Mining Company Limited: *See*—
Iio, Toshimasa; and Ohkubo, Toyokazu, 4,389,248, Cl. 75-99.000.
Superscope, Inc.: *See*—
Pearson, Erik W., 4,389,716, Cl. 369-6.000.
Sutherland-Schultz Limited: *See*—
Dawdy, James E., 4,389,640, Cl. 340-664.000.

Sutter, Franz; and Straumann, Fritz, to Institut Straumann AG. Device comprising a plate and screws for fastening a plate to a bone. 4,388,921, Cl. 128-92.00B.

Suttles, Jefferies C., to Anchoring International, Inc. Underwater pipe anchoring device. 4,389,034, Cl. 248-49.000.

Sutton, John H.; and Woodruff, Rebecca J., to Beckman Instruments, Inc. Centrifuge tube holder. 4,389,374, Cl. 422-104.000.

Suzuki, Atsushi: *See*—
Harada, Masato; Suzuki, Atsushi; Yamada, Sadahiko; and Masuda, Jun, 4,389,518, Cl. 526-97.000.

Suzuki, Osamu: *See*—
Oishi, Kengo; Moriwaki, Masayoshi; Suzuki, Osamu; and Kamiyama, Kouji, 4,389,010, Cl. 226-196.000.
Oishi, Kengo; Suzuki, Osamu; and Komiyama, Choji, 4,389,690, Cl. 360-132.000.

Suzuki Sogyo Kabushiki Kaisha: *See*—
Nakanishi, Motoyasu, 4,388,866, Cl. 101-426.000.

Suzuki, Susumu; and Okuma, Akitoshi, to Sony Corporation. Television camera apparatus. 4,389,675, Cl. 358-229.000.

Suzuki, Yasoji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS Integrated logic circuit device with improved switching speed characteristics. 4,389,582, Cl. 307-452.000.

Swenson, Paul M.: *See*—
Devellian, Richard D.; and Swenson, Paul M., 4,389,002, Cl. 222-146.0HS.

Sykes, Larry M.: *See*—
Merritt, Henry B.; and Sykes, Larry M., 4,388,932, Cl. 131-291.000.

Syntex (U.S.A.) Inc.: *See*—
Kent, John S., 4,389,414, Cl. 424-308.000.
Kracklauer, John J., 4,389,220, Cl. 44-57.000.

Szalkiewicz, Andrew: *See*—
Diamond, Steven E.; Mares, Frank; and Szalkiewicz, Andrew, 4,389,348, Cl. 260-465.50R.

Szarka, Istvan; and Urbantsok, Janos, to Autoipari Kutato es Fejlexzto Vallalat. Hydro-pneumatic operating device actuated with a pneumatic pressure-medium or servo-operation, in particular for motor-vehicle clutches. 4,388,806, Cl. 60-547.100.

Taatjes, Steven W.: *See*—
Seyffert, Michael; and Taatjes, Steven W., 4,389,296, Cl. 204-206.000.

Tabuchi, Takeshi; and Abe, Matazo, to Takeda Chemical Industries, Ltd. Method for producing citric acid. 4,389,484, Cl. 435-144.000.

Tachi, Yasuo: *See*—
Seki, Katsumi; Tachi, Yasuo; and Shibata, Yoji, 4,389,310, Cl. 210-183.000.

Tadmor, Zehev: *See*—
Valsamis, Lefteris N.; and Tadmor, Zehev, 4,389,119, Cl. 366-99.000.

Tago, Keiichiro, to Fuji Electric Co. Ltd. Displacement converting circuit arrangement. 4,389,646, Cl. 340-870.370.

Takahashi, Michio: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,389,387, Cl. 423-447.700.

Takahashi, Sankichi: *See*—
Nishimura, Shigeoki; Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,389,253, Cl. 134-1.000.

Takai, Miyao: *See*—
Ogasawara, Hiroshi; and Takai, Miyao, 4,388,909, Cl. 123-501.000.

Takashima, Toshiyuki: *See*—
Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.

Takeda Chemical Industries, Ltd.: *See*—
Tabuchi, Takeshi; and Abe, Matazo, 4,389,484, Cl. 435-144.000.
Yamazaki, Kyuya; Igarashi, Sachio; and Shibata, Koichi, 4,389,519, Cl. 528-73.000.

Takeshita, Kazuhiro: *See*—
Adachi, Ryuichi; Yamada, Isao; and Takeshita, Kazuhiro, 4,389,299, Cl. 204-298.000.

Takeyama, Hidetoshi; Sakamoto, Siro; Sagawa, Koji; Tanishi, Tokio; Aihoshi, Hiroaki; and Morimoto, Takao, to Matsushita Electric Works, Ltd.; and Sauer, Hans, a part interest. Method for manufacturing electric switching block of electromagnetic relay. 4,388,757, Cl. 29-882.000.

Talres Development (N.A.) N.V.: *See*—
Drucker, David B., 4,389,394, Cl. 424-53.000.

Tamura, Poohsan N., to Honeywell Inc. High speed ambiguity function evaluation by optical processing utilizing a space variant linear phase shifter. 4,389,092, Cl. 350-162.120.

Tamura, Toshio: *See*—
Yamaguchi, Kiyoshi; Maki, Naoki; and Tamura, Toshio, 4,389,585, Cl. 310-52.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Samejima, Masayoshi; Hirata, Goichi; and Koida, Yoshiyuki, 4,389,331, Cl. 427-213.300.

Tanaka, Masato; Sonoda, Takenori; and Watanabe, Nobuhiko, to Sony Corporation. Method and apparatus for recording digitized information on a record medium. 4,389,681, Cl. 360-27.000.

Tanaka, Shuji; and Nagata, Toshio, to Yamaha Hatsudoki Kabushiki Kaisha. Two stroke engine having exhaust timing control valve means. 4,388,894, Cl. 123-65.0PE.

Tanaka, Steve K.: *See*—
Hanamoto, Mark S.; and Tanaka, Steve K., 4,389,491, Cl. 436-67.000.

Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, to Hitachi, Ltd. Combustion control apparatus. 4,389,184, Cl. 431-15.000.

Tanemura, Fumikazu, to Mino Yogyo Co., Ltd. Spinel-magnesia basic brick. 4,389,492, Cl. 501-112.000.

Tanguy, Bernard; Soubeyroux, Jean-Louis; Pezat, Michel; Portier, Josik; and Hagenmuller, Paul, to Agence Nationale de Valorization de la Recherche. Method of storing hydrogen in intimate mixtures of hydrides of magnesium and other metals or alloys. 4,389,326, Cl. 252-188.260.

Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, to Minolta Camera Co., Ltd. Camera with a voice command responsive system. 4,389,109, Cl. 354-60.00L.

Tanishi, Tokio: *See*—
Takeyama, Hidetoshi; Sakamoto, Siro; Sagawa, Koji; Tanishi, Tokio; Aihoshi, Hiroaki; and Morimoto, Takao, 4,388,757, Cl. 29-882.000.

Tanner, Lee E., to Allied Corporation. Amorphous alloys of nickel, aluminum and boron. 4,389,262, Cl. 148-403.000.

Tatami, Mitsuhige, to Sony Corporation. Apparatus for indicating the phase of the color subcarrier signal in each line of a color television signal. 4,389,663, Cl. 358-19.000.

Tayco Developments, Inc.: *See*—
Taylor, Douglas P., 4,389,045, Cl. 267-8.00R.

Taylor, Douglas P., to Tayco Developments, Inc. Liquid energy absorber device. 4,389,045, Cl. 267-8.00R.

TDK Electronics Co., Ltd.: *See*—
Hosaka, Akihiko; and Okuyama, Kiyotaka, 4,389,458, Cl. 428-425.900.

Techplastics, Inc.: *See*—
Streit, Kenneth F., 4,389,078, Cl. 312-322.000.

Teeter, Terry E., to Eaton Corporation. Auxiliary transmission neutral positioning and locking control and mechanism. 4,388,843, Cl. 74-745.000.

Tegral Technology Limited: *See*—
Brunt, William H.; and Thatcher, Kenneth C., 4,389,359, Cl. 264-69.000.

Teijin Limited: *See*—
Shimada, Keizo; Mera, Hiroshi; Nakamura, Tsutomu; and Aoki, Akihiro, 4,389,521, Cl. 528-336.000.

Teitsu Denshi Kenkyusho Co., Ltd.: *See*—
Narushima, Isao; and Nakano, Morio, 4,388,830, Cl. 73-597.000.

Tektronix, Inc.: *See*—
Deibele, Florian C.; and Schell, William F., 4,389,551, Cl. 200-51.00R.

Telang, Anil, to Becton, Dickinson and Company. Suction canister system for serial collection of fluids. 4,388,922, Cl. 604-319.000.

Tenniswood, David M., to Creative Controls, Inc. Wheelchair. 4,389,056, Cl. 280-289.0WC.

Tereschenko, Valdimir P.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Teschendorf, Hans-Juergen: *See*—
May, Hans-Joachim; Lenke, Dieter; Gries, Josef; Teschendorf, Hans-Juergen; and Worstmann, Wolfgang, 4,389,403, Cl. 424-258.000.

Teshima, Toru; Ariga, Kazuo; and Kasahara, Takao, to Stanley Electric Co., Ltd. Multi-colored liquid crystal display device with characters not displaying shifts in positions even upon color changes. 4,389,095, Cl. 350-334.000.

Th. Kieserling & Albrecht, GmbH & Co. KG: *See*—
Lorenz, Horst, 4,389,148, Cl. 414-85.000.

Thakur, Pramod C.: *See*—
Jones, Emrys H., Jr.; and Thakur, Pramod C., 4,388,974, Cl. 175-325.000.

Thatcher, Kenneth C.: *See*—
Brunt, William H.; and Thatcher, Kenneth C., 4,389,359, Cl. 264-69.000.

Thermalloy Incorporated: *See*—
Breese, Leonard S., 4,388,967, Cl. 165-80.00B.

Thies, Jerome A.: *See*—
Williams, Hugh K.; and Thies, Jerome A., 4,388,976, Cl. 180-69.00R.

Thies, Peter, to Wagener Schwelm GmbH & Co. Belt press with enclosed hydraulic actuator. 4,388,860, Cl. 100-270.000.

Thiessen, Robert J.: *See*—
Whalen-Shaw, Michael J.; and Thiessen, Robert J., 4,389,476, Cl. 430-64.000.

Thoemke, Dale W. Fishing system. 4,388,774, Cl. 43-21.200.

Thoma, Frank; Hoffmann, Karlheinz; and Seiler, Gunter, to Daimler-Benz Aktiengesellschaft. Fuel injection nozzle for internal combustion engines. 4,389,018, Cl. 239-533.300.

Thomas, Reese R.; Ellicson, John W.; and Somerville, Ronald, to Ozite Corporation. Cut pile fabric with fused carrier and method of making same. 4,389,443, Cl. 428-92.000.

Thomas, Reese R.: *See*—
Pickens, Robert C., Jr.; Kirchherr, Patricia R.; and Thomas, Reese R., 4,389,442, Cl. 428-92.000.

Thomas, Thomas A., Jr. Apparatus for silk screen printing. 4,388,862, Cl. 101-126.000.

Thompson, Stephen M.: *See*—
Underwood, J. Larry; Thompson, Stephen M.; and Budde, John S., 4,388,998, Cl. 220-307.000.

Thoma, Roland, to Buckbee-Mears Company. Color picture tube and aperture mask therefor. 4,389,592, Cl. 313-403.000.

Thomson-CSF: *See*—
Favreau, Michel, 4,389,668, Cl. 358-83.000.
Morel, Gilbert; Frappart, Pierre; and Saint Marcoux, Roland, 4,389,703, Cl. 363-61.000.

Thoor, Henry-Albert: *See*—
Carminati, Jean; Ehret, Thomas; Ovieve, Gerard; and Thoor, Henry-Albert, 4,388,948, Cl. 137-615.000.

Thornton, Thomas A.; and Holaday, Veldon D., Jr., to Babcock & Wilcox Company, The. Sintering $UO_2$ and oxidation of $UO_2$ with microwave radiation. 4,389,355, Cl. 264-0.500.

Thyssen Industrie AG: *See*—
Girod, Hansjochen; and Korn, Gerhard, 4,388,872, Cl. 105-99.000.
Spiegel, Werner, 4,388,966, Cl. 165-45.000.

Tice, Thomas R.; and Lewis, Danny H., to Stolle Research and Development Corporation. Microencapsulation process. 4,389,330, Cl. 427-213.360.

Todt, Jorn: *See*—
Schaefer, Axel; Motika, Werner; Bender, Wolfgang; Todt, Jorn; and Oels, Udo, 4,389,344, Cl. 260-369.000.

Tohoku Metal Industries, Ltd.: *See*—
Sato, Hiroyasu; Sato, Yoshiharu; and Baba, Tetsuro, 4,389,628, Cl. 335-208.000.

Tohoku University: *See*—
Ono, Shoichi; and Yokoo, Kuniyoshi, 4,389,165, Cl. 417-49.000.

Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See*—
Mori, Takeshi; Takashima, Toshiyuki; Asahina, Kenichi; Matsumiya, Toshiharu; and Sugita, Ariyasu, 4,389,508, Cl. 524-548.000.

Tokyo Electric Co., Ltd.: *See*—
Nakamura, Yoshikathu, 4,389,634, Cl. 382-11.000.

Tokyo Keiki Co., Ltd.: *See*—
Mito, Akio, 4,388,942, Cl. 137-85.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kamei, Taketo; and Hayashi, Motokazu, 4,389,595, Cl. 315-57.000.
Nagao, Nobuya; and Sakai, Teturou, 4,389,665, Cl. 358-23.000.
Nakamura, Makoto; and Sugiyama, Fumio, 4,389,540, Cl. 179-1.50A.
Nakamura, Yoshikathu, 4,389,634, Cl. 382-11.000.
Onishi, Shunichi; Obara, Masaharu; Sakurai, Masaru; Murakami, Junzo; and Makino, Shinichi, 4,389,623, Cl. 333-16.000.
Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, 4,389,268, Cl. 156-150.000.
Suzuki, Yasoji; and Matsuo, Kenji, 4,389,582, Cl. 307-452.000.
Yamada, Tetsuo, 4,389,661, Cl. 357-24.000.
Yanabu, Satoru; Nishiwaki, Susumu; Yamashita, Mizuho; Satoh, Toshikazu; Murakami, Yoichi; and Imai, Susumu, 4,389,693, Cl. 361-127.000.

Toll, Alexander R.; and Gibboni, Roland R. Electronic apparatus for teaching mathematics. 4,389,194, Cl. 434-201.000.

Tomasky, Philip P. Triangular antenna. 4,389,651, Cl. 343-794.000.

Tompa, Albert S.; French, David M.; and White, Billy R., to United States of America, Navy. Breakdown of solid propellants and explosives, recovery of nitramines. 4,389,265, Cl. 149-109.600.

Tomy Corporation: *See*—
Spring, Gorden W., 4,388,776, Cl. 46-44.000.

Toombs, Gary C.: *See*—
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,389,081, Cl. 339-89.00M.

Toray Industries, Inc.: *See*—
Endo, Tadakazu; and Saitoh, Shigemitsu, 4,389,364, Cl. 264-167.000.
Kitanaka, Minoru; and Deguchi, Yukichi, 4,389,453, Cl. 428-240.000.

Torii, Taketsugu; Oota, Hisatoshi; and Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Voice warning device using entertainment speaker. 4,389,639, Cl. 340-539.000.

Tosaka, Yoichi: *See*—
Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; Tosaka, Yoichi; and Haraguchi, Shosuke, 4,389,111, Cl. 354-173.000.

Toshiba Chemical Products Company: *See*—
Oshima, Renzo; Kyojima, Yoshiyuki; Fujii, Takara; and Kato, Shoji, 4,389,268, Cl. 156-150.000.

Toudo, Kenzi: *See*—
Tanaka, Toshio; Nakagawa, Sumio; and Toudo, Kenzi, 4,389,184, Cl. 431-15.000.

Townsend, Francis H.: *See*—
Bendyshe Walton, Andre P. J.; Townsend, Francis H.; and Ribet, John N., 4,389,580, Cl. 307-400.000.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Yamasoba, Takahiko; Tsuchiko, Susumu; and Yoshino, Takashi, 4,389,438, Cl. 428-35.000.

Toyo Kogyo Co. Ltd.: *See*—
Kodama, Hiroshi; Maeda, Tooru; and Miyatani, Toshio, 4,388,901, Cl. 123-213.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Sugiyama, Shinichi; and Nakatomi, Takayoshi, 4,388,906, Cl. 123-492.000.

Toyota Jidosha Kogyo K.K.: *See*—
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, 4,388,903, Cl. 123-440.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Arai, Hajime; and Haga, Shoji, 4,388,844, Cl. 74-752.00C.
Sengoku, Ikuo, 4,389,068, Cl. 296-206.000.
Sengoku, Ikuo, 4,389,069, Cl. 296-206.000.
Torii, Taketsugu; Oota, Hisatoshi; and Arai, Hiroshi, 4,389,639, Cl. 340-539.000.

Trane Company, The: *See*—
Eber, David H.; and Sauls, John R., 4,389,171, Cl. 418-15.000.

Trefileries et Cableries Chiers-Chatillon-Gorcy: *See*—
Piboue, Pierre, 4,389,025, Cl. 242-55.000.

Treichler, James W.: *See*—
Minor, Ray C.; Treichler, James W.; and Bohman, Carl E., 4,389,154, Cl. 414-699.000.

Trentelman, Christiaan C. M.; van Dijk, Johannis C.; and Oomen, Johannes H. C. M., to DHV Raadgevend Ingenieursbureau BV. Process for chemical reduction of the phosphate content of water. 4,389,317, Cl. 210-715.000.

Trezeguet, Jean-Pierre; and Vives, Jean-Patrick, to Societe Anonyme dite: Les Cables de Lyon. Method of manufacturing an optical fibre cable. 4,388,800, Cl. 57-7.000.

Trezequet, Jean-Pierre, to Les Cables de Lyon. Underwater optical fibre cable. 4,389,088, Cl. 350-96.230.

Triad Metal Products Company, The: *See*—
Riedel, Elmer E., 4,388,748, Cl. 24-269.000.

Tridon Limited: *See*—
Kimber, Edward G.; and Norris, Peter C., 4,388,742, Cl. 15-250.420.

Tritsch, Ludwig, to Personal Products Company. Diaper with potentially elastic tape fastener. 4,389,212, Cl. 604-389.000.

Trumper, Thomas, to Gewerkschaft Eisenhutte Westfalia. Apparatus for use with cutting drums of mineral machines. 4,389,073, Cl. 299-45.000.

Tseng, Ching-Ho. Rotary power plant runner/shutter mechanism. 4,389,174, Cl. 418-222.000.

Tsuchiko, Susumu: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Yamasoba, Takahiko; Tsuchiko, Susumu; and Yoshino, Takashi, 4,389,438, Cl. 428-35.000.

Tsuda, Hiroshi: *See*—
Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,389,121, Cl. 368-63.000.

Tsuda, Kiyoshi: *See*—
Suda, Kazuyoshi; Fujimura, Akira; and Tsuda, Kiyoshi, 4,388,994, Cl. 209-564.000.

Tsukamoto, Goro: *See*—
Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, 4,389,408, Cl. 424-271.000.

Tsunoda, Masakazu; and Mori, Kazuyuki, to Nissan Motor Company, Limited. Voice warning system for an automotive vehicle provided with an automatic speed control device. 4,389,537, Cl. 179-1.0SM.

Tsushima, Shuichi: *See*—
Matsumoto, Fuyuhiko; Ikeda, Kunihiko; and Tsushima, Shuichi, 4,389,113, Cl. 355-3.0DD.

Tsuzuki, Akira, to Citizen Watch Co., Ltd. Frequency divider. 4,389,728, Cl. 377-114.000.

Tsuzuki, Hanzo, to Casio Computer Co., Ltd. Electronic cash register. 4,389,707, Cl. 364-405.000.

Turbine Metal Technology, Inc.: *See*—
Clark, Eugene V.; and Sievers, George K., 4,389,439, Cl. 428-36.000.

Tursi, Thomas P.: *See*—
Rodgers, David T.; Tursi, Thomas P.; and Bryan, Thomas J., 4,388,782, Cl. 51-241.00A.

Tusset, Vittorino; Hancart, Jules; and Paulus, Philippe, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Continuous treatment of steel sheet. 4,389,254, Cl. 134-3.000.

Tyler, Derek E.: *See*—
Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., 4,388,962, Cl. 164-455.000.

Ubukata, Susumu; Mizutani, Yasukazu; and Iyada, Syozo, to Ubukatu, Susumu. Snap action thermally responsive switch. 4,389,630, Cl. 337-363.000.

Ubukatu, Susumu: *See*—
Ubukata, Susumu; Mizutani, Yasukazu; and Iyada, Syozo, 4,389,630, Cl. 337-363.000.

Uchida, Isamu: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, 4,389,109, Cl. 354-60.00L.

Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; Tosaka, Yoichi; and Haraguchi, Shosuke, to Canon Kabushiki Kaisha. Camera. 4,389,111, Cl. 354-173.000.

Uemura, Kazuo: *See*—
Hattori, Hiroyuki; and Uemura, Kazuo, 4,389,569, Cl. 250-363.00S.

Uesugi, Toshiaki; and Inden, Toshikazu, to Chino Works, Ltd. Changeover switch for actuating a plurality of reed switches disposed in a circle. 4,389,627, Cl. 335-206.000.

Uetrecht, Dale M., to Baldwin Piano & Organ Company. Multiple octave generator tuning system. 4,388,850, Cl. 84-1.240.

Ukai, Akitoshi: *See*—
Yamada, Osamu; Higaki, Yuzo; and Ukai, Akitoshi, 4,389,346, Cl. 260-410.700.

Ulmer, Christian: *See*—
Ruch, Urs; and Ulmer, Christian, 4,388,887, Cl. 112-279.000.

Ulrich, Klaus; Janssen, Wilhelm; and Herbrig, Reinhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for separating a sponge iron product produced in a rotary furnace. 4,389,040, Cl. 266-137.000.

Umezawa, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. Speed change control system for an automatic transmission. 4,388,986, Cl. 188-77.00R.

Underwood, J. Larry; Thompson, Stephen M.; and Budde, John S., to Underwood, J. Larry. Lid and container with improved fastening and sealing means. 4,388,998, Cl. 220-307.000.

Underwood, James R.: *See*—
Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., 4,388,854, Cl. 89-46.000.

Union Carbide Corporation: *See*—
Fuhrhop, Ronald E., 4,389,038, Cl. 266-51.000.
Nadin, Robert P.; and Lee, Jannan G., 4,389,143, Cl. 406-197.000.
Sokolik, Joseph E., Jr.; Kosseim, Alexander J. M.; and Atwood, Gilbert R., 4,389,383, Cl. 423-243.000.

Union Tank Car: *See*—
Carleton, John V.; and Nenadic, Nick, 4,388,873, Cl. 105-377.000.

United Catalysts Inc.: *See*—
Merriam, Jay S.; and Hogg, Cecil B., 4,389,335, Cl. 252-439.000.

United Kingdom Atomic Energy Authority: *See*—
Ramsay, John D. F., 4,389,385, Cl. 423-338.000.

United Merchants & Manufacturers, Inc.: *See*—
Smith, Larry G., 4,388,740, Cl. 8-151.000.

United States Gypsum Company: *See*—
Brooke, Michael E., 4,388,778, Cl. 49-125.000.

United States of America
Agriculture: *See*—
DeLoach, John R.; Harris, Robert L.; Mayery Richard T.; and Ihler, Garret M., 4,389,209, Cl. 604-53.000.
Army: *See*—
Allen, Henry C., 4,389,263, Cl. 149-11.000.
Ballato, Arthur, 4,389,275, Cl. 156-626.000.
Dabrowski, Joseph M.; Daubar, Valentine P.; Fryer, Richard H.; Geraltowski, John; Underwood, James R.; Waid, Roger K.; and Gilvydis, Jaunutis B., 4,388,854, Cl. 89-46.000.
DeSantis, Charles M.; and Jasper, Louis J., Jr., 4,389,593, Cl. 315-4.000.
Durenec, Peter, 4,388,808, Cl. 62-6.000.
Fanuele, Michael A.; McCray, Joseph A.; and Rittenbach, Otto F., 4,389,647, Cl. 343-7.700.
Parkhurst, Ross A.; Rodkey, David L.; and Wedel, John O., 4,389,649, Cl. 343-17.500.
Stern, Richard A., 4,389,650, Cl. 343-768.000.
Energy: *See*—
Crewe, Albert V., 4,389,571, Cl. 250-396.00R.
Davidson, Jackson B.; and Case, Arthur L., 4,389,670, Cl. 358-111.000.
Dowdy, Edward J.; Nicholson, Nicholas; and Caldwell, John T., 4,389,568, Cl. 250-362.000.
Duncan, Charles S.; Piotrowski, Paul A.; Skutch, Maria E.; and McHugh, James P., 4,389,377, Cl. 422-246.000.
Fenimore, Edward E., 4,389,633, Cl. 382-26.000.
Joy, Richard W., 4,389,466, Cl. 429-27.000.
Kurnit, Norman A., 4,389,617, Cl. 330-4.300.
Ryan, Michael J., 4,389,063, Cl. 292-307.00R.
Singh, Raj N.; and Dusek, Joseph T., 4,389,467, Cl. 429-41.000.
General Counsel-Code GP: *See*—
St. Clair, Anne K.; and St. Clair, Terry L., 4,389,504, Cl. 524-233.000.
National Aeronautics and Space Administration: *See*—
Cunningham, Joseph W.; and Wing, Lawrence D., 4,388,965, Cl. 165-32.000.
Navy: *See*—
Baitis, A. Erich; Woolaver, Dennis A.; and Nigon, Richard T., 4,388,889, Cl. 114-144.00E.
Bauman, Ronald M., 4,389,618, Cl. 330-149.000.
Edelson, Stuart K., 4,388,870, Cl. 102-494.000.
Edleson, Stuart K., 4,388,869, Cl. 102-494.000.
Kalivretenos, Chris A.; and Brown, Michael A., 4,389,028, Cl. 244-3.210.
Rodgers, David T.; Tursi, Thomas P.; and Bryan, Thomas J., 4,388,782, Cl. 51-241.00A.
Rosenberg, Kenneth W., 4,389,062, Cl. 292-190.000.
San Miguel, Anthony, 4,389,030, Cl. 244-129.300.
Stevenson, David A., 4,389,274, Cl. 156-624.000.
Tompa, Albert S.; French, David M.; and White, Billy R., 4,389,265, Cl. 149-109.600.
Whitlock, Robert R., 4,389,590, Cl. 310-313.00R.

U.S. Philips Corporation: *See*—
Bloem, Jan; and van den Brekel, Cornelis H. J., 4,389,273, Cl. 156-605.000.
Camerik, Eduard, 4,389,717, Cl. 369-75.000.
deVries, Gerhard H. F., 4,389,276, Cl. 156-630.000.
deVries, Gerhard H. F., 4,389,277, Cl. 156-630.000.
Jansen, Friedrich L.; and Phillips, Ian, 4,389,547, Cl. 179-81.00R.
Khoe, Giok D.; Meuleman, Lambertus J.; and Rozzi, Tullio E., 4,389,567, Cl. 250-213.00R.
Rouffet, Denis, 4,389,727, Cl. 375-110.000.
Schiebel, Ulrich; and Wadow, Dieter, 4,389,610, Cl. 324-72.500.
Van de Donk, Michael J. C.; Heinemans, Hendricus C. A. M.; and Legierse, Petrus E. J., 4,389,719, Cl. 369-275.000.
van Rosmalen, Gerard E., 4,389,101, Cl. 350-486.000.

United Technologies Corporation: *See*—
Brumen, Claudio, 4,389,161, Cl. 416-220.00R.
Levine, Herbert R.; and Landry, L. Gerard, 4,389,587, Cl. 310-208.000.
McGregor, Charles W.; and Payette, Lionel J., 4,389,510, Cl. 524-600.000.
Smeggil, John G.; and Bornstein, Norman S., 4,389,463, Cl. 428-659.000.

Universal Flow Monitors: *See*—
Rosaen, Nils O., 4,388,835, Cl. 73-861.580.

University of California, The Regents of the: *See*—
Sovak, Milos; and Ranganathan, Ramachandran, 4,389,526, Cl. 549-347.000.

Uno, Yoshihiro, to Matsushita Electric Industrial Company, Limited. Image storage target and image pick-up and storage tube. 4,389,591, Cl. 313-391.000.

Urbantsok, Janos: *See*—
Szarka, Istvan; and Urbantsok, Janos, 4,388,806, Cl. 60-547.100.

USM Corporation: *See*—
Brookes, David J., 4,388,753, Cl. 29-433.000.
Valsamis, Lefteris N.; and Tadmor, Zehev, 4,389,119, Cl. 366-99.000.

Utsumi, Isamu: *See*—
Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, 4,389,408, Cl. 424-271.000.

Valadez, Alfonso L. Eyeglass pen cleaner. 4,389,132, Cl. 401-195.000.

Valentine, Roy H.; and Brandman, Harold A., to Givaudan Corporation. Process for the preparation of dihydrocinnamaldehyde derivatives. 4,389,527, Cl. 549-438.000.

Valmet Oy: *See*—
Kukkula, Juhani, 4,388,943, Cl. 137-85.000.

Valsamis, Lefteris N.; and Tadmor, Zehev, to USM Corporation. Rotary processors. 4,389,119, Cl. 366-99.000.

Van Alsburg, Earl R., to American Can Company. Can support system. 4,389,147, Cl. 413-69.000.

Van de Donk, Michael J. C.; Heinemans, Hendricus C. A. M.; and Legierse, Petrus E. J., to U.S. Philips Corporation. Optically readable information disk. 4,389,719, Cl. 369-275.000.

van den Brekel, Cornelis H. J.: *See*—
Bloem, Jan; and van den Brekel, Cornelis H. J., 4,389,273, Cl. 156-605.000.

van Dijk, Johannis C.: *See*—
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Margaroli, John L.; and Cimperman, Frederick J., 4,388,858, Cl. 99-494.000.

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Renirie, Alexis C. M.; Mensink, Kornelis A.; and Wittkampf, Frederik H. M., 4,388,929, Cl. 128-419.0PG.

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Kogler, Peter, 4,389,075, Cl. 299-81.000.
Vogel, Bruno, to N.V. APR Europe S.A. Method and apparatus for manufacturing seamless printing roll. 4,389,116, Cl. 355-85.000.
Vogelsgesang, Roland: *See*—
Mollier, Eckhard; Bures, Horst-Dieter; Magosch, Karl-Heinz; Kesper, Bernt; Muschelknautz, Edgar; and Vogelsgesang, Roland, 4,389,226, Cl. 55-208.000.
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Voytilla, Jospeh M.: *See*—
Shandy, Walter V.; and Voytilla, Jospeh M., 4,389,271, Cl. 156-242.000.
W. H. Brady Co.: *See*—
Walber, James P., 4,389,583, Cl. 307-522.000.
W. R. Grace & Co.: *See*—
Block, Jacob; and Green, Peter C., 4,389,319, Cl. 252-8.50A.
Wacker-Werke GmbH & Co. KG: *See*—
Riedl, Franz, 4,389,137, Cl. 404-113.000.
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Wadenstein, Theodore S. Rotary vibrator with resilient shock mount to provide linear movement. 4,389,120, Cl. 366-126.000.
Wadow, Dieter: *See*—
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Wagenbach, Wolfgang: *See*—
Konig, Werner; Wagenbach, Wolfgang; May, Hans; and Bleidt, Rolf, 4,389,553, Cl. 200-148.00H.
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Thies, Peter, 4,388,860, Cl. 100-270.000.
Wagner, Delmer W. Controlled gate circuit. 4,389,578, Cl. 307-256.000.
Wagner, Robert F., to Sealy, Incorporated. Mattress construction and mattress cover therein. 4,388,738, Cl. 5-421.000.
Wagner, Theodore W.; Liang, Sam; and Muzumdar, Deepak R., to Siemens Corporation; and Siemens Corporation. Digital telephone apparatus. 4,389,544, Cl. 179-2.0DP.
Waid, Roger K.: *See*—
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Waite, Malcolm W.: *See*—
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Walsh, Paul J.; and Burkart, Jeffrey A., to Cabot Corporation. Process for enclosing a pin shank within an enclosing member and article produced thereby which is substantially devoid of a gap between the enclosing member and the head of the pin. 4,389,462, Cl. 428-564.000.
Walter, Jurgen, to Hackforth GmbH & Co. KG. Resilient shaft coupling, more particularly an interposed cardan shaft coupling. 4,389,204, Cl. 464-91.000.
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Warner "Autolitho" Corporation: *See*—
Warner, Gordon R., 4,388,864, Cl. 101-148.000.
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MacDonald, J. G. Fraser, 4,388,988, Cl. 192-12.0BA.
Warner, Gordon R., to Warner "Autolitho" Corporation. Lithographic dampening system. 4,388,864, Cl. 101-148.000.
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Strack, Richard R., 4,389,089, Cl. 350-96.260.
Wasco Products, Inc.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,388,784, Cl. 52-200.000.
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Weber, Ralph; and Wells, William, to Korf Industrie und Handel GmbH und Co KG. Metallurgical melting and refining unit. 4,389,043, Cl. 266-218.000.
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Dorgan, Roderick J.; and Webster, Richard A., 4,389,406, Cl. 424-270.000.
Wedel, John O.: *See*—
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Weiner, Milton L., to Mobil Oil Corporation. Flexible film laminate and retortable food pouch therefrom. 4,389,436, Cl. 428-35.000.
Weinert, Raymond J., Jr.; and Benton, Kenneth C., to Standard Oil Company, The. Supported catalysts useful for the polymerization of alpha-olefins. 4,389,334, Cl. 252-429.00B.
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Zelnick, Seymour, 4,388,796, Cl. 53-441.000.
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Weber, Ralph; and Wells, William, 4,389,043, Cl. 266-218.000.
Welsh, Lawrence W., Jr.: *See*—
Bargon, Joachim; Hiraoka, Hiroyuki; and Welsh, Lawrence W., Jr., 4,389,482, Cl. 430-325.000.
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Wenzl, Helmut: *See*—
Klatt, Karl-Heinz; Pietz, Siegfried; and Wenzl, Helmut, 4,389,239, Cl. 75-0.50R.
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Shandy, Walter V.; and Voytilla, Jospeh M., 4,389,271, Cl. 156-242.000.
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Detering, Richard L., 4,389,606, Cl. 318-712.000.
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Goldstein, Norman P., 4,389,570, Cl. 250-370.000.
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Whitlock, Robert R., to United States of America, Navy. System for recording waveforms using spatial dispersion. 4,389,590, Cl. 310-313.00R.
Whittington, George R. Parachute. 4,389,031, Cl. 244-145.000.
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Post, Stephen F., 4,389,602, Cl. 318-341.000.

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Williams, James B.: *See*—
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Wojtowicz, John A., to Olin Corporation. Rapidly dissolving mixtures containing trichloroisocyanuric acid. 4,389,318, Cl. 210-755.000.

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Woodhouse, John L., to Lucas Industries Limited. Electric storage batteries. 4,389,471, Cl. 429-178.000.

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Wooding, Patrick J., 4,389,724, Cl. 373-33.000.

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Woodruff, Rebecca J.: *See*—
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Wooten, David R.: *See*—
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Worstmann, Wolfgang: *See*—
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Wright, Newton E. Trap for small animals. 4,388,775, Cl. 43-69.000.

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Hoskinson, William R.; Carley, Joseph C.; and Ippolito, Anthony C., 4,388,851, Cl. 84-1.240.

Wurth, Hans: *See*—
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Bar-on, Ari; and Debesis, John R., 4,389,654, Cl. 346-75.000.
Fischbeck, Kenneth H., 4,389,652, Cl. 346-1.100.
Lovibond, Michael J., 4,389,011, Cl. 227-5.000.
Perna, Theodore P.; Raschke, Curt R.; and Baker, William L., Jr., 4,389,658, Cl. 346-140.00R.
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Yamada, Osamu; Higaki, Yuzo; and Ukai, Akitoshi, to Nisshin Oil Mills, Limited, The. Esterification reaction products and cosmetics containing same. 4,389,346, Cl. 260-410.700.

Yamada, Sadahiko: *See*—
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Yamada, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state image-sensing device capable of shifting signal charges to a charged transfer region at a high speed. 4,389,661, Cl. 357-24.000.

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Yamato Scale Company, Ltd.: *See*—
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Yamazaki, Kyuya; Igarashi, Sachio; and Shibata, Koichi, to Takeda Chemical Industries, Ltd. Composition for polyurethane adhesives. 4,389,519, Cl. 528-73.000.

Yamazaki, Yoshihiko: *See*—
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Yanagi, Toshiaki: *See*—
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Yannascoli, Donald; and Fraser, Bruce A., to Carrier Corporation. Apparatus for modulating the capacity of a reciprocating compressor. 4,389,168, Cl. 417-298.000.

Yarmal, Anatoly A.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.

Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S. Method of supplying pulverized fuel mixture to blast furnace tuyeres. 4,389,244, Cl. 75-42.000.

Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., to Olin Corporation. Electromagnetic casting method and apparatus. 4,388,962, Cl. 164-455.000.
Yasuda, Yasushi: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Mitono, Yoshiharu; Imaizumi, Taketo; and Ohmichi, Hitoshi, 4,388,755, Cl. 29-577.00C.
Yasunobe, Junji: *See*—
Shimizu, Masami; and Yasunobe, Junji, 4,389,052, Cl. 277-67.000.
Yazu, Shuji: *See*—
Nakai, Tetsuo; Kono, Yuichiro; Yazu, Shuji; and Hara, Akio, 4,389,465, Cl. 428-698.000.
Yokohama Rubber Co., Ltd., The: *See*—
Wada, Makoto; Iwasaki, Koichi; and Nakata, Hajime, 4,388,960, Cl. 152-209.00R.
Yokoo, Kuniyoshi: *See*—
Ono, Shoichi; and Yokoo, Kuniyoshi, 4,389,165, Cl. 417-49.000.
Yokoyama, Hiroshi: *See*—
Nigorikawa, Atsushi; Yokoyama, Hiroshi; and Fujieda, Takanori, 4,389,723, Cl. 371-27.000.
Yokozawa, Norio: *See*—
Hotta, Masao; Miyamoto, Yoshikazu; Yokozawa, Norio; and Oshima, Yoshimitsu, 4,389,711, Cl. 364-556.000.
Yonahara, Yoshihiro. Foothold device. 4,388,982, Cl. 182-82.000.
Yong, Samuel H.; Perlbachs, Donna J.; Wallin, Glenn R.; and Houle, Roberta C., to Pillsbury Company, The. Dough glaze. 4,389,420, Cl. 426-94.000.
Yonushonis, Celeste; and Walters, Thomas E., to Combustion Engineering, Inc. Ceramic fiber board. 4,389,282, Cl. 162-145.000.
Yoshiba, Yasutaka: *See*—
Kimura, Yoshiyuki; Shiobara, Masaji; and Yoshiba, Yasutaka, 4,388,912, Cl. 123-569.000.
Yoshida Kogyo K. K.: *See*—
Fukuroi, Takeo, 4,388,751, Cl. 29-410.000.
Yoshida, Masafumi; and Nakamura, Kenichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Data recording sheet. 4,389,445, Cl. 428-77.000.
Yoshida, Nobuyuki: *See*—
Nakanishi, Takeshi; Harada, Kazuo; Yoshida, Nobuyuki; and Ogino, Etsuo, 4,389,306, Cl. 209-5.000.
Yoshida, Seietsu; Ito, Masao; Kawai, Yujio; and Ogawa, Toshihisa, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo K.K. Device for controlling air-fuel ratio for internal combustion engines. 4,388,903, Cl. 123-440.000.
Yoshii, Hiroe: *See*—
Hiraga, Hirofumi; Yoshimura, Minoru; Ikeda, Shigeho; and Yoshii, Hiroe, 4,389,483, Cl. 435-110.000.
Yoshikawa Kogyo Co., Ltd.: *See*—
Noro, Katsuhiko; Nagaki, Yusei; Sasaki, Shinpei; and Kumagai, Sakae, 4,389,360, Cl. 264-71.000.
Yoshikawa, Ryoichi: *See*—
Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; Tosaka, Yoichi; and Haraguchi, Shosuke, 4,389,111, Cl. 354-173.000.
Yoshimura, Minoru: *See*—
Hiraga, Hirofumi; Yoshimura, Minoru; Ikeda, Shigeho; and Yoshii, Hiroe, 4,389,483, Cl. 435-110.000.
Yoshino, Takashi: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Yamasoba, Takahiko; Tsuchiko, Susumu; and Yoshino, Takashi, 4,389,438, Cl. 428-35.000.
Young, William R.; and Zepp, Stanley R., to Harris Corporation. Time-division multiplex serial loop. 4,389,721, Cl. 370-88.000.
Yuasa, Yoshio; Ishikawa, Norio; and Horie, Izumi, to Minolta Camera Kabushiki Kaisha. Color meter. 4,389,118, Cl. 356-404.000.
Yuen, Henry K.: *See*—
Eng, Clifford D.; Gambell, James W.; and Yuen, Henry K., 4,389,325, Cl. 252-186.350.
Yun, Ik Y.: *See*—
Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., 4,388,962, Cl. 164-455.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Winkelmann, Siegfried; and Schulz, Horst, 4,388,973, Cl. 175-321.000.
Zalevsky, Mikhail A.: *See*—
Yaroshevsky, Stanislav L.; Lukyanchenko, Leonid F.; Sidorenko, Grigory N.; Skladanovsky, Evgeny N.; Zalevsky, Mikhail A.; Machikin, Viktor I.; Bannikov, Jury G.; Ryabenko, Anatoly I.; Okazov, Shamil T.; Stepanov, Vasily V.; Danilin, Evgeny A.; Yarmal, Anatoly A.; Nekhaev, Grigory E.; Bat, Jury I.; Popov, Nikolai N.; Kamardin, Alexei M.; Tereschenko, Valdimir P.; and Stankevich, Romualda S., 4,389,244, Cl. 75-42.000.
Zamek, Otto S.: *See*—
Pauze, Denis R.; and Zamek, Otto S., 4,389,457, Cl. 428-379.000.
Zebarth, Ralph S., to Meyn U.S.A., Inc. Method for preparing poultry for fresh-pack handling. 4,388,811, Cl. 62-63.000.
Zelnick, Seymour, to Weldotron Corporation. Stretch wrap system and method of packaging. 4,388,796, Cl. 53-441.000.
Zenhausern, Max: *See*—
Willa, Siegfried; and Zenhausern, Max, 4,389,026, Cl. 242-55.300.
Zepp, Stanley R.: *See*—
Young, William R.; and Zepp, Stanley R., 4,389,721, Cl. 370-88.000.
Zhorov, Vladimor I.; Kirsh, Jury E.; Shumsky, Viktor I.; Karaputadze, Temuri M.; and Bairamov, Jury J. Pain-killing preparation. 4,389,404, Cl. 424-260.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JUNE, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Acme Highway Products Corporation: *See*—
Paccio, Guy S., Re. 31,283, Cl. 404-68.000.

Consolidated Natural Gas Service Company, Inc.: *See*—
Swenson, Paul F.; and Moore, Paul B., Re. 31,281, Cl. 62-160.000.

Everett, Peter K. Production of electrolytic battery active manganese dioxide. Re. 31,286, Cl. 204-96.000.

Hamada, Hiroshi: *See*—
Yano, Kozo; Inami, Yasuhiko; Hamada, Hiroshi; and Uede, Hisashi, Re. 31,280, Cl. 29-592.00R.

Holmes, Horace D. Locking fastener. Re. 31,284, Cl. 411-311.000.

Inami, Yasuhiko: *See*—
Yano, Kozo; Inami, Yasuhiko; Hamada, Hiroshi; and Uede, Hisashi, Re. 31,280, Cl. 29-592.00R.

Massachusetts Institute of Technology: *See*—
Patil, Suhas S., Re. 31,287, Cl. 340-825.790.

Minnesota Mining and Manufacturing Company: *See*—
van Turnhout, Jan; and Rieke, Johannes C., Re. 31,285, Cl. 55-155.000.

Moore, Paul B.: *See*—
Swenson, Paul F.; and Moore, Paul B., Re. 31,281, Cl. 62-160.000.

National Petro Chemicals Corporation: *See*—
Ware, James R., Re. 31,282, Cl. 222-305.000.

Patil, Suhas S., to Massachusetts Institute of Technology. Asynchronous logic array. Re. 31,287, Cl. 340-825.790.

Paccio, Guy S., to Acme Highway Products Corporation. Elastomeric expansion seal. Re. 31,283, Cl. 404-68.000.

Rieke, Johannes C.: *See*—
van Turnhout, Jan; and Rieke, Johannes C., Re. 31,285, Cl. 55-155.000.

Sharp Kabushiki Kaisha: *See*—
Yano, Kozo; Inami, Yasuhiko; Hamada, Hiroshi; and Uede, Hisashi, Re. 31,280, Cl. 29-592.00R.

Swenson, Paul F.; and Moore, Paul B., to Consolidated Natural Gas Service Company, Inc. Heat pump system. Re. 31,281, Cl. 62-160.000.

Uede, Hisashi: *See*—
Yano, Kozo; Inami, Yasuhiko; Hamada, Hiroshi; and Uede, Hisashi, Re. 31,280, Cl. 29-592.00R.

van Turnhout, Jan; and Rieke, Johannes C., to Minnesota Mining and Manufacturing Company. Method for manufacturing a filter of electrically charged electret fiber material and electret filters obtained according to said method. Re. 31,285, Cl. 55-155.000.

Ware, James R., to National Petro Chemicals Corporation. Shot-feeding metering valve. Re. 31,282, Cl. 222-305.000.

Yano, Kozo; Inami, Yasuhiko; Hamada, Hiroshi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Electrochromic display device manufacture method. Re. 31,280, Cl. 29-592.00R.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

McCullough, John E., to Authur D. Little, Inc. Scroll-type apparatus with fixed throw crank drive mechanism, B1 4,082,484, Cl. 418—55.

Arthur D. Little, Inc.: *See*—
McCullough, John E. B1 4,082,484, Cl. 418—55.

Hodosa, Milton. Method for desensitizing teeth. B1 3,863,006, Cl. 424—49.

Cavalli, Alfredo. Apparatus for preparing fresh farinaceous pastes. B1 4,219,318, Cl. 425—190.

# LIST OF DESIGN PATENTEES

Agfa-Gevaert AG: *See*—
Jost, Jochen, 269,436, Cl. D16-26.000.

American Cyanamid Company: *See*—
Butter, Reinhart; and Li, Lehmann K., 269,459, Cl. D24-27.000.

Appelblatt, Irving; and Krawiecki, Peter, to Cadillac Gage Company. Six-wheel armored vehicle. 269,418, 6-21-83, Cl. D12-12.000.

Auerbach, Frederick F. Garbage disposal plunger. 269,471, 6-21-83, Cl. D32-35.000.

Avis, Michael J. Golf club bag carrier for a motorized golf cart. 269,472, 6-21-83, Cl. D34-15.000.

Babcock, Lowell C.; and Schultz, Duane L., to Custom Packaging Co. Inc. Bird house. 269,468, 6-21-83, Cl. D30-3.000.

Bechtel, Daniel L. Scope mount for a rifle. 269,449, 6-21-83, Cl. D22-7.000.

Bechtel, Daniel L. Scope mount for a rifle. 269,450, 6-21-83, Cl. D22-7.000.

Bell Telephone Laboratories, Incorporated: *See*—
Kowalik, John, Jr.; Longhitano, Ronald; and McGarvey, John N., 269,432, Cl. D14-59.000.

Belrecolt S.A.: *See*—
Kaetzel, Pierre, 269,435, Cl. D15-10.000.

Breen, John J. Tree stand. 269,392, 6-21-83, Cl. D6-105.000.

Bricker, Stewart J. Support caddy for tools or the like. 269,396, 6-21-83, Cl. D6-180.000.

Brunswick Corporation: *See*—
Fee, Robert W.; and Robbins, Richard J., 269,452, Cl. D22-25.000.

Butter, Reinhart; and Li, Lehmann K., to American Cyanamid Company. Surgical stapling instrument. 269,459, 6-21-83, Cl. D24-27.000.

Cadillac Gage Company: *See*—
Appelblatt, Irving; and Krawiecki, Peter, 269,418, Cl. D12-12.000.

Caroli, Italo, to DBM Reflex Enterprises, Inc. Lamp for vehicles. 269,464, 6-21-83, Cl. D26-28.000.

CBS Inc.: *See*—
Wilson, Gregg; and Page, John F., 269,437, Cl. D17-14.000.

Central Engineering Co., Inc.: *See*—
Umlauf, Thomas J.; and Reese, Robert J., 269,419, Cl. D12-96.000.

Cervantes, Rafael T., to Westbury Foundation, The; and Sociedad de Dispositivos Reductores de Tabaco, S.A., a part interest to each. Cigar and cigarette filter perforator. 269,465, 6-21-83, Cl. D27-51.000.

Claman, Mike T. Chair. 269,391, 6-21-83, Cl. D6-57.000.

Compur-Electronic GmbH: *See*—
Retzer, Erich; and Schwarz, Gerhard, 269,416, Cl. D10-81.000.

Custom Packaging Co. Inc.: *See*—
Babcock, Lowell C.; and Schultz, Duane L., 269,468, Cl. D30-3.000.

DBM Reflex Enterprises, Inc.: *See*—
Caroli, Italo, 269,464, Cl. D26-28.000.

De Mars, Robert A. Combined can handle and opener. 269,404, 6-21-83, Cl. D8-34.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,427, 6-21-83, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,428, 6-21-83, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle housing. 269,429, 6-21-83, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,430, 6-21-83, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,431, 6-21-83, Cl. D13-30.000.
Ehrlich, John T. Combined wall mounted bottle opener and cap receptacle. 269,405, 6-21-83, Cl. D8-37.000.
Ekener, Jan B. H., to Jan Ekener AB. Mounting tool for wall expansion anchors. 269,407, 6-21-83, Cl. D8-52.000.
Essex, John D., to Hoover Company, The. Cleaner main body or the like. 269,470, 6-21-83, Cl. D32-32.000.
Fee, Robert W.; and Robbins, Richard J., to Brunswick Corporation. Fishing reel. 269,452, 6-21-83, Cl. D22-25.000.
Fender, C. Leo. Guitar bridge. 269,440, 6-21-83, Cl. D17-21.000.
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Knob. 269,409, 6-21-83, Cl. D8-307.000.
Fisher, Bryan; and Miller, Richard J. Model skull. 269,448, 6-21-83, Cl. D19-62.000.
Fisons Limited: *See*—
Young, David M., 269,463, Cl. D24-62.000.
Freeflight International Pty. Limited: *See*—
Holmes a Court, Juliet, 269,390, Cl. D6-11.000.
Fujitsu Limited: *See*—
Matsuda, Shuya; and Kakiuchi, Yoshinori, 269,441, Cl. D18-4.000.
Green, Harry. Domestic incinerator apparatus. 269,455, 6-21-83, Cl. D23-85.000.
Gruber, Kurt, to Wilkinson Sword Gesellschaft mit beschrankter Haftung. Razor. 269,466, 6-21-83, Cl. D28-46.000.
Hennessey, Thomas W. Gun security cabinet. 269,394, 6-21-83, Cl. D6-167.000.
Heske, Thor: *See*—
Larsen, Jorgen; and Heske, Thor, 269,393, Cl. D6-116.000.
Hirsh Company: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 269,409, Cl. D8-307.000.
Holmes a Court, Juliet, to Freeflight International Pty. Limited. Toy rocking chair. 269,390, 6-21-83, Cl. D6-11.000.
Hoover Company, The: *See*—
Essex, John D., 269,470, Cl. D32-32.000.
Houseman, David G., to John Deks Australia Pty., Ltd. Seal for a roof vent pipe or similar article. 269,454, 6-21-83, Cl. D23-42.000.
Ibuki Kogyo Co., Ltd.: *See*—
Shintaku, Yoshishige, 269,417, Cl. D10-120.000.
Igloo Corporation: *See*—
Ruxton, Craig, 269,398, Cl. D7-77.000.
Inverness International Corporation: *See*—
Mann, Samuel J., 269,467, Cl. D28-73.000.
Ishiwara, Koichiro, to Olympus Optical Company Ltd. Endoscope. 269,457, 6-21-83, Cl. D24-18.000.
Jan Ekener AB: *See*—
Ekener, Jan B. H., 269,407, Cl. D8-52.000.
Jeremiah, Bruce S. Jewelry display card. 269,412, 6-21-83, Cl. D9-457.000.
Jeremiah, Bruce S. Jewelry display card. 269,413, 6-21-83, Cl. D9-457.000.
Johansson, Bengt. Thimble for a rope. 269,410, 6-21-83, Cl. D8-367.000.
Johansson, Bengt. Thimble for a rope. 269,411, 6-21-83, Cl. D8-367.000.
John Deks Australia Pty., Ltd.: *See*—
Houseman, David G., 269,454, Cl. D23-42.000.
Jonsson, Leif. Collapsible jack for automobiles and the like. 269,473, 6-21-83, Cl. D34-31.000.
Jost, Jochen, to Agfa-Gevaert AG. Slide projector magazine. 269,436, 6-21-83, Cl. D16-26.000.
Kaetzel, Pierre, to Belrecolt S.A. Skirt for agricultural machines for moving fodder. 269,435, 6-21-83, Cl. D15-10.000.
Kakiuchi, Yoshinori: *See*—
Matsuda, Shuya; and Kakiuchi, Yoshinori, 269,441, Cl. D18-4.000.
Kapp, Dennis R. Adjustable table. 269,395, 6-21-83, Cl. D6-177.000.
Kassai Kabushiki Kaisha: *See*—
Kassai, Kenzou, 269,421, Cl. D12-129.000.
Kassai, Kenzou, to Kassai Kabushiki Kaisha. Baby carriage. 269,421, 6-21-83, Cl. D12-129.000.
Kaye, Philip: *See*—
Tremaglio, Anthony M.; and Kaye, Philip, 269,406, Cl. D8-47.000.
Kohler Co.: *See*—
Kohler, Herbert V., Jr., 269,460, Cl. D24-38.000.
Kohler, Herbert V., Jr., to Kohler Co. Whirlpool bath tub. 269,460, 6-21-83, Cl. D24-38.000.
Kowalik, John, Jr.; Longhitano, Ronald; and McGarvey, John N., to Bell Telephone Laboratories, Incorporated. Housing for a telephone amplifier. 269,432, 6-21-83, Cl. D14-59.000.
Krawiecki, Peter: *See*—
Appelblatt, Irving; and Krawiecki, Peter, 269,418, Cl. D12-12.000.
Kruckel, Peter A.; and Mock, Gerhard, to Messrs. Schwan-Stabilo Schwanhausser GmbH & Co. Writing instrument. 269,445, 6-21-83, Cl. D19-48.000.
Lam, Yanta H. T., to Meyer Manufacturing Co. Ltd. Covered saucepan. 269,399, 6-21-83, Cl. D7-361.000.
Larsen, Jorgen; and Heske, Thor. Boot holder. 269,393, 6-21-83, Cl. D6-116.000.
Leviton Manufacturing Co., Inc.: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,427, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,428, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,429, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,430, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,431, Cl. D13-30.000.
Li, Lehmann K.: *See*—
Butter, Reinhart; and Li, Lehmann K., 269,459, Cl. D24-27.000.
Longhitano, Ronald: *See*—
Kowalik, John, Jr.; Longhitano, Ronald; and McGarvey, John N., 269,432, Cl. D14-59.000.
M and W Electric Manufacturing Co.: *See*—
Wayman, Theodore A., 269,402, Cl. D8-10.000.
Mann, Samuel J., to Inverness International Corporation. Hot wax epilation console. 269,467, 6-21-83, Cl. D28-73.000.
Matsuda, Shuya; and Kakiuchi, Yoshinori, to Fujitsu Limited. Electronic cash register. 269,441, 6-21-83, Cl. D18-4.000.
Matsushita Electric Industrial Co.: *See*—
Nakajima, Iwao; and Takenaka, Kazumasa, 269,442, Cl. D18-7.000.
McClure, Joseph C., Jr. Boat and utility trailer stand or the like. 269,420, 6-21-83, Cl. D12-106.000.
McDermott, Bernard A., to Questor Corporation. Roof ventilator. 269,456, 6-21-83, Cl. D23-153.000.
McGarvey, John N.: *See*—
Kowalik, John, Jr.; Longhitano, Ronald; and McGarvey, John N., 269,432, Cl. D14-59.000.
Medebach, Jurgen, to Pelikan Aktiengesellschaft. Set of felt pens. 269,444, 6-21-83, Cl. D19-42.000.
Melrose Displays, Inc.: *See*—
Van Duyne, Fred, 269,397, Cl. D6-191.000.
Merritt, Willard, to Oury Grip Grip U.S.A., Inc. Cycle hand grip. 269,408, 6-21-83, Cl. D8-303.000.
Messrs. Schwan-Stabilo Schwanhausser GmbH & Co.: *See*—
Kruckel, Peter A.; and Mock, Gerhard, 269,445, Cl. D19-48.000.
Meyer Manufacturing Co. Ltd.: *See*—
Lam, Yanta H. T., 269,399, Cl. D7-361.000.
Miller, Richard J.: *See*—
Fisher, Bryan; and Miller, Richard J., 269,448, Cl. D19-62.000.
Million, Theodore L. Page holder for an open book. 269,443, 6-21-83, Cl. D19-34.000.
Miyata, Masao. Shovel blade. 269,403, 6-21-83, Cl. D10-8.000.
Mock, Gerhard: *See*—
Kruckel, Peter A.; and Mock, Gerhard, 269,445, Cl. D19-48.000.
Motorola, Inc.: *See*—
Nagele, Albert L., 269,434, Cl. D14-76.000.
Mulholland, Lawrence A. Wheel shock absorber. 269,422, 6-21-83, Cl. D12-159.000.
Nagele, Albert L., to Motorola, Inc. Control unit for a vehicular two-way FM radio or similar article. 269,434, 6-21-83, Cl. D14-76.000.
Nakajima, Iwao; and Takenaka, Kazumasa, to Matsushita Electric Industrial Co. Electronic translator. 269,442, 6-21-83, Cl. D18-7.000.
Olympus Optical Company Ltd.: *See*—
Ishiwara, Koichiro, 269,457, Cl. D24-18.000.
Oury Grip Grip U.S.A., Inc.: *See*—
Merritt, Willard, 269,408, Cl. D8-303.000.
Page, John F.: *See*—
Wilson, Gregg; and Page, John F., 269,437, Cl. D17-14.000.
Paton, Reginald G. Pilot triangulation scale. 269,415, 6-21-83, Cl. D10-65.000.
Peavey Electronics Corp.: *See*—
Peavey, Hartley D., 269,438, Cl. D17-21.000.
Peavey, Hartley D., 269,439, Cl. D17-21.000.
Peavey, Hartley D., to Peavey Electronics Corp. Guitar bridge. 269,438, 6-21-83, Cl. D17-21.000.
Peavey, Hartley D., to Peavey Electronics Corp. Guitar bridge. 269,439, 6-21-83, Cl. D17-21.000.
Pelikan Aktiengesellschaft: *See*—
Medebach, Jurgen, 269,444, Cl. D19-42.000.
Peterson, Michael: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 269,409, Cl. D8-307.000.
Pirovano, Rino. Desk tray for stationery articles. 269,446, 6-21-83, Cl. D19-75.000.
Pittaway, Alan K., to Wilkinson Sword, Limited. Garden shears. 269,401, 6-21-83, Cl. D8-5.000.
Pyle, Larry J. Electric power distribution unit or similar article. 269,426, 6-21-83, Cl. D13-12.000.
Qually, Robert L. Pacifier. 269,461, 6-21-83, Cl. D24-45.000.
Qually, Robert L. Pacifier. 269,462, 6-21-83, Cl. D24-45.000.

Questor Corporation: *See*—
McDermott, Bernard A., 269,456, Cl. D23-153.000.
Raheb, Bill J. Deck of playing cards. 269,447, 6-21-83, Cl. D21-45.000.
Rankin, Marcus W. Bird cage. 269,469, 6-21-83, Cl. D30-4.000.
Reese, Robert J.: *See*—
Umlauf, Thomas J.; and Reese, Robert J., 269,419, Cl. D12-96.000.
Retzer, Erich; and Schwarz, Gerhard, to Compur-Electronic GmbH. Photometer. 269,416, 6-21-83, Cl. D10-81.000.
Riepe, Waldemar, to Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH. Garden pond filter. 269,453, 6-21-83, Cl. D23-4.000.
Rivera, Lester: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,427, Cl. D13-30.000.
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,428, Cl. D13-30.000.
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Robbins, Richard J.: *See*—
Fee, Robert W.; and Robbins, Richard J., 269,452, Cl. D22-25.000.
Rosenbaum, Saul: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,427, Cl. D13-30.000.
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Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,431, Cl. D13-30.000.
Rubery Owen Holdings Limited: *See*—
Waite, William, 269,423, Cl. D12-169.000.
Ruxton, Craig, to Igloo Corporation. Insulated container. 269,398, 6-21-83, Cl. D7-77.000.
Saer, George A.: *See*—
Stein, Jeffrey D.; and Saer, George A., 269,433, Cl. D14-59.000.
Schultz, Duane L.: *See*—
Babcock, Lowell C.; and Schultz, Duane L., 269,468, Cl. D30-3.000.
Schwarz, Gerhard: *See*—
Retzer, Erich; and Schwarz, Gerhard, 269,416, Cl. D10-81.000.
Seikosha Co., Ltd.: *See*—
Sugano, Hisako, 269,414, Cl. D10-18.000.
Shaffner, Richard L. Incision approximator. 269,458, 6-21-83, Cl. D24-26.000.
Shintaku, Yoshishige, to Ibuki Kogyo Co., Ltd. Siren. 269,417, 6-21-83, Cl. D10-120.000.
Sociedad de Dispositivos Reductores de Tabaco, S.A.: *See*—
Cervantes, Rafael T., 269,465, Cl. D27-51.000.
Stein, Jeffrey D.; and Saer, George A. Auxiliary telephone cradle. 269,433, 6-21-83, Cl. D14-59.000.
Sugano, Hisako, to Seikosha Co., Ltd. Pocket clock. 269,414, 6-21-83, Cl. D10-18.000.
Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 269,409, Cl. D8-307.000.
Takenaka, Kazumasa: *See*—
Nakajima, Iwao; and Takenaka, Kazumasa, 269,442, Cl. D18-7.000.
Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH: *See*—
Riepe, Waldemar, 269,453, Cl. D23-4.000.
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Umlauf, Thomas J.; and Reese, Robert J., to Central Engineering Co., Inc. Truck. 269,419, 6-21-83, Cl. D12-96.000.
Usbeck, Fredrich W. Handle for kitchen tools, utensils or the like. 269,400, 6-21-83, Cl. D7-395.000.
Van Duyne, Fred, to Melrose Displays, Inc. Arm extension for a rug sample display stand. 269,397, 6-21-83, Cl. D6-191.000.
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Cervantes, Rafael T., 269,465, Cl. D27-51.000.
Whitaker, John B., Jr. Combined gas cap and funnel. 269,425, 6-21-83, Cl. D12-197.000.
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Gruber, Kurt, 269,466, Cl. D28-46.000.
Wilkinson Sword, Limited: *See*—
Pittaway, Alan K., 269,401, Cl. D8-5.000.
Wilson, Gregg; and Page, John F., to CBS Inc. Electric guitar. 269,437, 6-21-83, Cl. D17-14.000.
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Shoesmith, Leonard H., 5,062, Cl. 76.000.
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## ISSUED JUNE 21, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

161 R 4,388,733
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CLASS 3

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CLASS 8

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151 4,388,740
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527 4,389,214
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78 4,388,767

CLASS 36

68 4,388,768

CLASS 37

126 AC 4,388,769

CLASS 40

1.6 4,388,770
587 4,388,771

CLASS 42

1 S 4,388,772
75 B 4,388,773

CLASS 43

21.2 4,388,774
69 4,388,775

CLASS 44

6 4,389,218
51 4,389,219
57 4,389,220
66 4,389,221

CLASS 46

44 4,388,776
79 4,388,777

CLASS 48

76 4,389,222

CLASS 49

125 4,388,778
253 4,388,779

CLASS 51

128 4,388,780
206 R 4,388,781
241 A 4,388,782
307 4,389,223

CLASS 52

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200 4,388,784
222 4,388,785
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719 4,388,791

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435 4,388,795
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12 4,388,801

CLASS 60

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527 4,388,805
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16 4,389,232
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60.1 4,389,234
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103 4,389,237
115 4,389,238

CLASS 72

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68 4,388,817
81 4,388,818
234 4,388,819
458 4,388,820

CLASS 73

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57 4,388,823
64.1 4,388,824
115 4,388,825
167 4,388,826
302 4,388,827
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384 4,388,829
428 4,388,839
597 4,388,830
623 4,388,831
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718 4,388,833
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89.2 4,388,837
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501 M 4,388,840
573 F 4,388,841
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862 4,388,845

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0.5 R 4,389,239
4,389,241
20 R 4,389,242
23 4,389,243
42 4,389,244
58 4,389,245
60 4,389,246
72 4,389,247
99 4,389,248
129 4,389,249
232 4,389,250
255 4,389,251

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CLASS 83

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666 4,388,848

CLASS 84

1.18 4,388,849
1.24 4,388,850
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284 4,388,852

CLASS 89

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46 4,388,854
198 4,388,855

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CLASS 99

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494 4,388,858
533 4,388,859

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270 4,388,860

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129 4,388,863
148 4,388,864
401.1 4,388,865
426 4,388,866

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473 4,388,868
494 4,388,869
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79 4,388,874

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224 4,388,875
275 4,388,876
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86 4,388,878

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80 4,388,881
121.12 4,388,882
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221 4,388,885
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279 4,388,887

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90 4,388,888
144 E 4,388,889

CLASS 116

204 4,388,890

CLASS 118

215 4,388,891

CLASS 122

4 D 4,388,892

CLASS 123

25 J 4,388,893
65 PE 4,388,894
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73 PP 4,388,895
90.17 4,388,897
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198 DB 4,388,900
198 E 4,388,899
213 4,388,901
425 4,388,902
440 4,388,903
4,388,904
4,388,905
492 4,388,906
494 4,388,907
500 4,388,908
501 4,388,909
547 4,388,910
557 4,388,911
569 4,388,912
585 4,388,913

CLASS 124

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CLASS 126

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92 B 4,388,921
295 4,388,923
303.1 4,388,924
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335.5 4,388,926
419 PG 4,388,927
4,388,928
4,388,929
419 PS 4,388,930
425 4,388,931

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291 4,388,932
293 4,388,933
339 4,388,934

CLASS 132

83 R 4,388,935
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1 4,389,253
3 4,389,254
73 4,388,937
104 4,388,938

CLASS 135

3 R 4,388,939

CLASS 136

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85 4,388,942
4,388,943
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614.06 4,388,947
615 4,388,948
625.17 4,388,949
829 4,388,950

CLASS 139

11 4,388,951

CLASS 140

92.1 4,388,952
149 4,388,953

CLASS 141

39 4,388,954
286 4,388,955

CLASS 144

332 4,388,956
366 4,388,957

CLASS 148

1.5 4,389,255
4,389,256
4,389,257
3 4,389,258
6.15 R 4,389,259
6.15 Z 4,389,260
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CLASS 149

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CLASS 150

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297 4,389,272
605 4,389,273
624 4,389,274
626 4,389,275
630 4,389,276
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4,389,278
640 4,389,279
645 4,389,280
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CLASS 160

332 4,388,961

CLASS 162

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CLASS 164

455 4,388,962

CLASS 165

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CLASS 166

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382 4,388,970
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CLASS 173

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CLASS 174

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CLASS 175

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325 4,388,974

CLASS 177

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CLASS 179

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1 SM 4,389,537
4,389,539
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1.5 A 4,389,540
2 B 4,389,543
2 DP 4,389,544
6.07 4,389,545
18 B 4,389,546
81 R 4,389,547
110 A 4,389,548

CLASS 180

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219 4,388,978
226 4,388,979
271 4,388,980

CLASS 181

119 4,388,981

CLASS 182

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189 4,388,983

CLASS 184

54 4,388,984

CLASS 188

65.4 4,388,985
77 R 4,388,986

CLASS 192

3.26 4,388,987
12 BA 4,388,988

CLASS 198

339 4,388,989
645 4,388,990

CLASS 200

5 R 4,389,549
44 4,389,550
51 R 4,389,551
68 4,389,552
148 A 4,389,554
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303 4,389,555

CLASS 201

19 4,389,283

CLASS 202

247 4,389,284

CLASS 203

9 4,389,285

CLASS 204

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455 4,388,992
611 4,388,993

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11 LE 4,389,300
59 4,389,301
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107 4,389,303
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**CLASS 209**

5 4,389,306
211 4,389,307
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198.2 4,389,313
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357 4,389,315
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85 CM 4,389,557
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121 L 4,389,560
121 PP 4,389,559
124.34 4,389,561
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70 4,388,996
209 4,388,997
307 4,388,998
416 4,388,999

**CLASS 221**

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**CLASS 222**

63 4,389,001
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305 Re.31,282
321 4,389,003
402.22 4,389,004

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159 4,389,005
164 4,389,006

**CLASS 226**

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123 4,389,008
188 4,389,009
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**CLASS 227**

5 4,389,011
120 4,389,012

**CLASS 229**

45 R 4,389,013

**CLASS 235**

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**CLASS 236**

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**CLASS 238**

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**CLASS 239**

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455 4,389,017
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24 4,389,020
275 4,389,022

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**CLASS 244**

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145 4,389,031
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37 4,389,033

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**CLASS 249**

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106 4,389,352
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40.1 4,389,357
45.1 4,389,358
69 4,389,359
71 4,389,360
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135 4,389,363
167 4,389,364
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558 4,389,366
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77 4,389,039
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218 4,389,043
271 4,389,044

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**CLASS 271**

227 4,389,046

**CLASS 272**

69 4,389,047

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95 4,389,053
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19 4,389,066
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365 4,389,070

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32 4,389,072
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52 4,389,585
67 R 4,389,586
208 4,389,587
242 4,389,588
258 4,389,589
313 R 4,389,590

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244 4,389,077
322 4,389,078
330 R 4,389,079

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391 4,389,591
403 4,389,592

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443 4,389,603
568 4,389,604
696 4,389,605
712 4,389,606
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48 4,389,609

**CLASS 324**

72.5 4,389,610
220 4,389,611
248 4,389,612
303 4,389,613

**CLASS 328**

61 4,389,614

**CLASS 329**

101 4,389,615
104 4,389,616

**CLASS 330**

4.3 4,389,617
149 4,389,618
288 4,389,619
304 4,389,620

**CLASS 331**

1 A 4,389,621

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19 4,389,622

**CLASS 333**

16 4,389,623
226 4,389,624
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**CLASS 335**

78 4,389,626
206 4,389,627
208 4,389,628

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709 4,389,641
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825.48 4,389,643
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870.37 4,389,646

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8 4,389,648
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75 4,389,654
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153.1 4,389,659

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96.20 4,389,086
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96.29 4,389,090
162.12 4,389,092
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334 4,389,095
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478 4,389,100
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524 4,389,084

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123 4,389,102

**CLASS 353**

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3 FU 4,389,114
3 TR 4,389,112
26 4,389,115
85 4,389,116
87 4,389,117

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**CLASS 357**

22 4,389,660
24 4,389,661
30 4,389,662

**CLASS 358**

19 4,389,663
22 4,389,664
23 4,389,665
47 4,389,666
75 4,389,667
83 4,389,668
101 4,389,669
111 4,389,670
124 4,389,671
160 4,389,672
4,389,673
213 4,389,674
229 4,389,675
243 4,389,676
280 4,389,677

**CLASS 360**

10.3 4,389,678
12 4,389,679
14.1 4,389,680
27 4,389,681
45 4,389,682
65 4,389,683
71 4,389,684
72.2 4,389,685
77 4,389,686
98 4,389,687
104 4,389,688
109 4,389,689
132 4,389,690

**CLASS 361**

8 4,389,691
29 4,389,692
48 4,389,694
55 4,389,695
127 4,389,693
293 4,389,696
380 4,389,697

**CLASS 362**

32 4,389,698
217 4,389,699
306 4,389,700
308 4,389,701

**CLASS 363**

21 4,389,702
61 4,389,703
62 4,389,704

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130 4,389,706
405 4,389,707
551 4,389,709
4,389,710
556 4,389,711
573 4,389,708

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104 4,389,705
127 4,389,712
163 4,389,713
189 4,389,714
200 4,389,715

**CLASS 366**

99 4,389,119
126 4,389,120

**CLASS 368**

63 4,389,121
110 4,389,122
250 4,389,123

**CLASS 369**

6 4,389,716
75 4,389,717
247 4,389,718
275 4,389,719

**CLASS 370**

62 4,389,720
88 4,389,721
100 4,389,722

**CLASS 371**

27 4,389,723

**CLASS 373**

33 4,389,724
40 4,389,725

**CLASS 374**

147 4,389,124
164 4,389,125

**CLASS 375**

27 4,389,726
110 4,389,727

**CLASS 376**

283 4,389,368
442 4,389,369

**CLASS 377**

20 4,389,563
114 4,389,728

**CLASS 378**

99 4,389,729
153 4,389,730

**CLASS 382**

11 4,389,634
26 4,389,633

**CLASS 400**

82 4,389,126
124 4,389,127
4,389,128
144.2 4,389,129
4,389,130
157.2 4,389,131

**CLASS 401**

195 4,389,132

**CLASS 403**

230 4,389,133
263 4,389,134
327 4,389,135

**CLASS 404**

68 Re.31,283
75 4,389,136
113 4,389,137

**CLASS 405**

43 4,389,138
163 4,389,139
195 4,389,140
211 4,389,141

**CLASS 406**

120 4,389,142
197 4,389,143

**CLASS 407**

82 4,389,144

**CLASS 408**

1 R 4,389,145
240 4,389,146

**CLASS 411**

311 Re.31,284

**CLASS 413**

69 4,389,147

**CLASS 414**

85 4,389,148
382 4,389,149
505 4,389,150
685 4,389,151
694 4,389,152
695.5 4,389,153
699 4,389,154
723 4,389,155
753 4,389,156
787 4,389,157

**CLASS 415**

148 4,389,158
206 4,389,160
219 A 4,389,159

**CLASS 416**

220 R 4,389,161
225 4,389,162

**CLASS 417**

2 4,389,163
36 4,389,164
49 4,389,165
234 4,389,166
289 4,389,167
298 4,389,168
417 4,389,169

**CLASS 418**

55 B1 4,082,484
15 4,389,170
4,389,171
61 A 4,389,172
146 4,389,173
222 4,389,174

**CLASS 420**

505 4,389,370

**CLASS 422**

15 4,389,371
88 4,389,372
98 4,389,373
104 4,389,374
111 4,389,375
228 4,389,376
246 4,389,377

**CLASS 423**

68 4,389,378
89 4,389,379
167 4,389,380
175 4,389,381
213.5 4,389,382

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|---|---|
| 243 | 4,389,383 |
| 304 | 4,389,384 |
| 338 | 4,389,385 |
| 365 | 4,389,386 |
| 447.7 | 4,389,387 |
| 461 | 4,389,388 |
| 510 | 4,389,389 |
| 584 | 4,389,390 |
| 610 | 4,389,391 |
| **CLASS 424** | |
| 49 | B1 3,863,006 |
| 1 | 4,389,392 |
| 19 | 4,389,393 |
| 53 | 4,389,394 |
| 85 | 4,389,395 |
| 92 | 4,389,396 |
| 180 | 4,389,397 |
| 181 | 4,389,398 |
| 248.5 | 4,389,399 |
| 248.52 | 4,389,400 |
| 248.56 | 4,389,401 |
| 251 | 4,389,402 |
| 258 | 4,389,403 |
| 260 | 4,389,404 |
| 262 | 4,389,405 |
| 270 | 4,389,406 |
| 271 | 4,389,407 |
| | 4,389,408 |
| 273 R | 4,389,409 |
| 283 | 4,389,410 |
| 301 | 4,389,411 |
| 305 | 4,389,412 |
| | 4,389,413 |
| 308 | 4,389,414 |
| 309 | 4,389,415 |
| | 4,389,416 |
| 317 | 4,389,417 |
| 365 | 4,389,418 |
| **CLASS 425** | |
| 190 | B1 4,219,318 |
| 82.1 | 4,389,175 |
| 101 | 4,389,176 |
| 144 | 4,389,177 |
| 237 | 4,389,178 |
| 302.1 | 4,389,179 |
| 403 | 4,389,180 |
| 461 | 4,389,181 |
| 505 | 4,389,182 |
| 589 | 4,389,183 |
| **CLASS 426** | |
| 72 | 4,389,419 |
| 94 | 4,389,420 |
| 330.4 | 4,389,421 |
| 388 | 4,389,422 |
| 417 | 4,389,423 |
| 546 | 4,389,424 |
| 598 | 4,389,425 |
| 602 | 4,389,426 |
| 631 | 4,389,427 |
| **CLASS 427** | |
| 54.1 | 4,389,428 |
| 90 | 4,389,429 |
| 213.3 | 4,389,331 |
| 213.36 | 4,389,330 |
| 230 | 4,389,430 |
| 242 | 4,389,431 |
| 299 | 4,389,432 |
| 341 | 4,389,433 |
| **CLASS 428** | |
| 17 | 4,389,434 |
| | 4,389,435 |
| 35 | 4,389,436 |
| | 4,389,437 |
| | 4,389,438 |
| 36 | 4,389,439 |
| | 4,389,440 |
| 65 | 4,389,441 |
| 77 | 4,389,445 |
| 92 | 4,389,442 |
| | 4,389,443 |
| 137 | 4,389,444 |
| 166 | 4,389,446 |
| 178 | 4,389,447 |
| 195 | 4,389,448 |
| 203 | 4,389,449 |
| 212 | 4,389,450 |
| | 4,389,451 |
| 215 | 4,389,452 |
| 240 | 4,389,453 |
| 318.6 | 4,389,454 |
| 328 | 4,389,455 |
| 375 | 4,389,456 |
| 379 | 4,389,457 |
| 425.9 | 4,389,458 |
| 457 | 4,389,459 |
| 458 | 4,389,460 |
| 543 | 4,389,461 |
| 564 | 4,389,462 |
| 659 | 4,389,463 |
| 667 | 4,389,464 |
| 698 | 4,389,465 |
| **CLASS 429** | |
| 27 | 4,389,466 |
| 41 | 4,389,467 |
| 70 | 4,389,468 |
| 98 | 4,389,469 |
| 152 | 4,389,470 |
| 178 | 4,389,471 |
| **CLASS 430** | |
| 10 | 4,389,472 |
| 17 | 4,389,473 |
| 37 | 4,389,474 |
| 58 | 4,389,475 |
| 64 | 4,389,476 |
| 81 | 4,389,477 |
| 97 | 4,389,478 |
| 216 | 4,389,479 |
| 271 | 4,389,480 |
| 319 | 4,389,481 |
| 325 | 4,389,482 |
| **CLASS 431** | |
| 15 | 4,389,184 |
| 164 | 4,389,185 |
| 173 | 4,389,186 |
| 277 | 4,389,187 |
| 284 | 4,389,188 |
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| 247 | 4,389,189 |
| | 4,389,190 |
| 250 | 4,389,191 |
| **CLASS 433** | |
| 166 | 4,389,192 |
| **CLASS 434** | |
| 174 | 4,389,193 |
| 201 | 4,389,194 |
| **CLASS 435** | |
| 110 | 4,389,483 |
| 144 | 4,389,484 |
| 191 | 4,389,485 |
| 253 | 4,389,486 |
| 273 | 4,389,487 |
| 280 | 4,389,488 |
| | 4,389,489 |
| **CLASS 436** | |
| 2 | 4,389,217 |
| 17 | 4,389,490 |
| 67 | 4,389,491 |
| **CLASS 440** | |
| 15 | 4,389,195 |
| | 4,389,196 |
| 38 | 4,389,197 |
| 60 | 4,389,198 |
| 74 | 4,389,199 |
| **CLASS 441** | |
| 70 | 4,389,200 |
| **CLASS 445** | |
| 26 | 4,389,201 |
| **CLASS 455** | |
| 153 | 4,389,731 |
| 160 | 4,389,732 |
| **CLASS 464** | |
| 33 | 4,389,202 |
| 34 | 4,389,203 |
| 91 | 4,389,204 |
| **CLASS 493** | |
| 315 | 4,389,205 |
| **CLASS 494** | |
| 42 | 4,389,206 |
| | 4,389,207 |
| **CLASS 501** | |
| 112 | 4,389,492 |
| 154 | 4,389,493 |
| **CLASS 521** | |
| 27 | 4,389,494 |
| 56 | 4,389,495 |
| **CLASS 523** | |
| 109 | 4,389,496 |
| 116 | 4,389,497 |
| 139 | 4,389,498 |
| 161 | 4,389,499 |
| 216 | 4,389,500 |
| 400 | 4,389,501 |
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| 37 | 4,389,502 |
| 38 | 4,389,503 |
| 233 | 4,389,504 |
| 376 | 4,389,505 |
| 377 | 4,389,506 |
| 460 | 4,389,507 |
| 548 | 4,389,508 |
| 591 | 4,389,509 |
| 600 | 4,389,510 |
| **CLASS 525** | |
| 68 | 4,389,511 |
| 112 | 4,389,512 |
| 186 | 4,389,513 |
| 364 | 4,389,514 |
| 420.5 | 4,389,515 |
| 534 | 4,389,516 |
| **CLASS 526** | |
| 64 | 4,389,517 |
| 97 | 4,389,518 |
| **CLASS 528** | |
| 73 | 4,389,519 |
| 89 | 4,389,520 |
| 336 | 4,389,521 |
| 503 | 4,389,522 |
| **CLASS 536** | |
| 59 | 4,389,523 |
| **CLASS 544** | |
| 016 | 4,389,524 |
| **CLASS 548** | |
| 187 | 4,389,525 |
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| 347 | 4,389,526 |
| 438 | 4,389,527 |
| 470 | 4,389,528 |
| 531 | 4,389,529 |
| **CLASS 556** | |
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| 43 | 4,389,531 |
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| 487 | 4,389,532 |
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| 95 | 4,389,208 |
| 177 | 4,389,210 |
| 319 | 4,388,922 |
| 383 | 4,389,211 |
| 389 | 4,389,212 |

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|---|---|---|
| D2— | 408 | 269,389 |
| D6— | 11 | 269,390 |
| | 57 | 269,391 |
| | 105 | 269,392 |
| | 116 | 269,393 |
| | 167 | 269,394 |
| | 177 | 269,395 |
| | 180 | 269,396 |
| | 191 | 269,397 |
| D7— | 77 | 269,398 |
| | 361 | 269,399 |
| | 395 | 269,400 |
| D8— | 5 | 269,401 |
| | 10 | 269,402 |
| | 34 | 269,404 |
| | 37 | 269,405 |
| | 47 | 269,406 |
| | 52 | 269,407 |
| | 303 | 269,408 |
| | 307 | 269,409 |
| | 367 | 269,410 |
| | | 269,411 |
| D9— | 457 | 269,412 |
| | | 269,413 |
| D10— | 8 | 269,403 |
| | 18 | 269,414 |
| | 65 | 269,415 |
| | 81 | 269,416 |
| | 120 | 269,417 |
| D12— | 12 | 269,418 |
| | 96 | 269,419 |
| | 106 | 269,420 |
| | 129 | 269,421 |
| | 159 | 269,422 |
| | 169 | 269,423 |
| | 179 | 269,424 |
| | 197 | 269,425 |
| D13— | 12 | 269,426 |
| | 30 | 269,427 |
| | | 269,428 |
| | | 269,429 |
| | | 269,430 |
| | | 269,431 |
| D14— | 59 | 269,432 |
| | | 269,433 |
| | 76 | 269,434 |
| D15— | 10 | 269,435 |
| D16— | 26 | 269,436 |
| D17— | 14 | 269,437 |
| | 21 | 269,438 |
| | | 269,439 |
| | | 269,440 |
| D18— | 4 | 269,441 |
| | 7 | 269,442 |
| D19— | 34 | 269,443 |
| | 42 | 269,444 |
| | 48 | 269,445 |
| | 62 | 269,448 |
| | 75 | 269,446 |
| D21— | 45 | 269,447 |
| D22— | 7 | 269,449 |
| | | 269,450 |
| | 10 | 269,451 |
| | 25 | 269,452 |
| D23— | 4 | 269,453 |
| | 42 | 269,454 |
| | 85 | 269,455 |
| | 153 | 269,456 |
| D24— | 18 | 269,457 |
| | 26 | 269,458 |
| | 27 | 269,459 |
| | 38 | 269,460 |
| | 45 | 269,461 |
| | | 269,462 |
| | 62 | 269,463 |
| D26— | 28 | 269,464 |
| D27— | 51 | 269,465 |
| D28— | 46 | 269,466 |
| | 73 | 269,467 |
| D30— | 3 | 269,468 |
| | 4 | 269,469 |
| D32— | 32 | 269,470 |
| | 35 | 269,471 |
| D34— | 15 | 269,472 |
| | 31 | 269,473 |

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| 01 : | 4,389,263 | | 4,389,400 | | 4,389,625 | | 4,389,363 | | 4,389,089 | | 4,389,062 |
| | 4,389,330 | | 4,389,414 | | 4,389,638 | | 4,389,416 | | 4,389,110 | | 4,389,325 |
| 04 : | 4,388,841 | | 4,389,429 | | 4,389,651 | | 4,389,442 | | 4,389,198 | | 4,389,350 |
| | 4,389,135 | | 4,389,439 | | 4,389,657 | | 4,389,443 | | 4,389,295 | | 4,389,421 |
| | 4,389,247 | | 4,389,466 | 10 : | 4,389,506 | | 4,389,467 | | 4,389,365 | 32 : | 4,389,049 |
| | 4,389,579 | | 4,389,482 | 11 : | 4,389,533 | | 4,389,478 | | 4,389,411 | | 4,389,501 |
| | 4,389,600 | | 4,389,491 | | 4,389,618 | | 4,389,564 | | 4,389,470 | 33 : | 4,388,938 |
| | 4,389,636 | | 4,389,526 | 12 : | 4,388,798 | | 4,389,571 | | 4,389,642 | | 4,389,177 |
| 06 : | 4,388,747 | | 4,389,538 | | 4,388,862 | | 4,389,637 | | 4,389,700 | | 4,389,428 |
| | 4,388,761 | | 4,389,545 | | 4,388,914 | 18 : | 4,388,743 | | 4,389,712 | | 4,389,587 |
| | 4,388,776 | | 4,389,549 | | 4,389,003 | | 4,388,770 | | 4,389,729 | 34 : | 4,388,760 |
| | 4,388,791 | | 4,389,598 | | 4,389,032 | | 4,388,898 | 26 : | Re.31,284 | | 4,388,782 |
| | 4,388,815 | | 4,389,602 | | 4,389,127 | | 4,389,023 | | 4,388,749 | | 4,388,796 |
| | 4,388,820 | | 4,389,608 | | 4,389,311 | | 4,389,061 | | 4,388,756 | | 4,388,886 |
| | 4,388,827 | | 4,389,612 | | 4,389,380 | | 4,389,249 | | 4,388,783 | | 4,388,922 |
| | 4,388,837 | | 4,389,613 | | 4,389,425 | | 4,389,462 | | 4,388,825 | | 4,388,925 |
| | 4,388,842 | | 4,389,615 | | 4,389,490 | | 4,389,498 | | 4,388,835 | | 4,388,926 |
| | 4,388,855 | | 4,389,635 | | 4,389,544 | | 4,389,510 | | 4,388,836 | | 4,388,958 |
| | 4,388,858 | | 4,389,659 | | 4,389,632 | 19 : | 4,388,976 | | 4,388,838 | | 4,389,014 |
| | 4,388,864 | | 4,389,660 | | 4,389,671 | | 4,389,058 | | 4,388,843 | | 4,389,017 |
| | 4,388,927 | | 4,389,695 | | 4,389,713 | | 4,389,153 | | 4,388,854 | | 4,389,117 |
| | 4,388,955 | | 4,389,701 | | 4,389,721 | 20 : | 4,388,848 | | 4,388,924 | | 4,389,143 |
| | 4,388,971 | | 4,389,702 | 13 : | 4,388,734 | | 4,389,077 | | 4,388,988 | | 4,389,172 |
| | 4,388,984 | | 4,389,716 | | 4,388,811 | 21 : | 4,389,074 | | 4,388,997 | | 4,389,197 |
| | 4,389,001 | | 4,389,730 | | 4,388,998 | | 4,389,335 | | 4,389,039 | | 4,389,217 |
| | 4,389,013 | 08 : | 4,388,888 | | 4,389,231 | 22 : | 4,389,139 | | 4,389,056 | | 4,389,229 |
| | 4,389,022 | | 4,388,991 | | 4,389,546 | | 4,389,312 | | 4,389,059 | | 4,389,235 |
| | 4,389,030 | | 4,389,005 | 16 : | 4,388,769 | | 4,389,435 | | 4,389,211 | | 4,389,238 |
| | 4,389,047 | | 4,389,141 | 17 : | 4,388,738 | 23 : | 4,388,784 | | 4,389,315 | | 4,389,258 |
| | 4,389,054 | | 4,389,149 | | 4,388,780 | | 4,388,805 | | 4,389,358 | | 4,389,275 |
| | 4,389,067 | | 4,389,160 | | 4,388,792 | | 4,388,949 | | 4,389,371 | | 4,389,291 |
| | 4,389,090 | | 4,389,161 | | 4,388,795 | 24 : | 4,388,877 | | 4,389,382 | | 4,389,293 |
| | 4,389,093 | | 4,389,220 | | 4,388,851 | | 4,388,950 | | 4,389,395 | | 4,389,322 |
| | 4,389,115 | | 4,389,560 | | 4,388,873 | | 4,388,965 | | 4,389,468 | | 4,389,328 |
| | 4,389,132 | | 4,389,687 | | 4,388,919 | | 4,388,989 | | 4,389,476 | | 4,389,348 |
| | 4,389,144 | | 4,389,715 | | 4,388,939 | | 4,389,028 | | 4,389,502 | | 4,389,372 |
| | 4,389,157 | 09 : | 4,388,736 | | 4,388,987 | | 4,389,071 | | 4,389,517 | | 4,389,397 |
| | 4,389,163 | | 4,388,777 | | 4,388,993 | | 4,389,265 | | 4,389,575 | | 4,389,433 |
| | 4,389,173 | | 4,388,915 | | 4,389,012 | | 4,389,319 | | 4,389,581 | | 4,389,441 |
| | 4,389,195 | | 4,388,962 | | 4,389,035 | | 4,389,499 | | 4,389,584 | | 4,389,444 |
| | 4,389,237 | | 4,388,999 | | 4,389,063 | | 4,389,590 | | 4,389,689 | | 4,389,448 |
| | 4,389,255 | | 4,389,007 | | 4,389,078 | | 4,389,649 | 27 : | 4,388,787 | | 4,389,514 |
| | 4,389,262 | | 4,389,114 | | 4,389,079 | | 4,389,680 | | 4,388,814 | | 4,389,528 |
| | 4,389,274 | | 4,389,119 | | 4,389,102 | 25 : | 4,388,779 | | 4,388,828 | | 4,389,555 |
| | 4,389,288 | | 4,389,224 | | 4,389,146 | | 4,388,807 | | 4,389,092 | | 4,389,593 |
| | 4,389,296 | | 4,389,225 | | 4,389,147 | | 4,388,809 | | 4,389,420 | | 4,389,619 |
| | 4,389,300 | | 4,389,267 | | 4,389,178 | | 4,388,945 | | 4,389,431 | | 4,389,647 |
| | 4,389,301 | | 4,389,318 | | 4,389,206 | | 4,388,964 | | 4,389,440 | | 4,389,650 |
| | 4,389,308 | | 4,389,327 | | 4,389,207 | | 4,388,990 | | 4,389,550 | | 4,389,672 |
| | 4,389,309 | | 4,389,386 | | 4,389,210 | | 4,388,996 | | 4,389,577 | | 4,389,676 |
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## DESIGN PATENTS

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269,422
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269,443

08 : 269,437
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11 : 269,469
12 : 269,420
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17 : 269,408
269,409
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26 : 269,395
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28 : 269,438
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41 : 269,405

44 : 269,412
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269,449
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49 : 269,471
55 : 269,419
269,460

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